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ECONOMIC RESEARCH SERVICE • U.S. DEPARTMENT OF AGRICULTURE • JANUARY 1965

A circular, high-contrast black and white photograph of a textured surface, likely a rock or mineral specimen. The image is dominated by a large, dark, irregularly shaped mass on the right side, which appears to be a different mineral phase or a shadow. The left side is lighter and more crystalline, with visible grain boundaries and some smaller, darker inclusions. The overall texture is rough and uneven, with a variety of shades of gray and black. The circular frame suggests it might be a view through a petroscope or a similar optical instrument.

**THE TWILIGHT BELT:** a little more to eat, but not enough to satisfy

**1965 WORLD FOOD SITUATION:** population paces food output

**PREPARATION FOR PROGRESS**





# Economic Trends



ITEM	UNIT OR BASE PERIOD	'57-'59 AVERAGE	1963		1964		
			YEAR	NOVEMBER	SEPTEMBER	OCTOBER	NOVEMBER
Prices:							
Price received by farmers	1910-14 = 100	242	242	242	236	236	234
Crops	1910-14 = 100	223	237	241	228	232	232
Livestock and Products	1910-14 = 100	258	245	243	244	239	236
Prices paid, interest, taxes and wage rates	1910-14 = 100	293	312	311	313	312	313
Family living items	1910-14 = 100	286	298	298	299	300	301
Production items	1910-14 = 100	262	273	271	270	269	269
Parity ratio		83	78	78	75	76	75
Wholesale prices, all commodities	1957-59 = 100	—	100.3	100.7	100.7	100.8	100.7
Commodities other than farm and food	1957-59 = 100	—	100.7	100.9	101.1	101.5	101.6
Farm products	1957-59 = 100	—	95.7	96.2	95.7	93.8	94.0
Food, processed	1957-59 = 100	—	101.1	102.5	102.2	101.7	100.9
Consumer price index, all items <sup>1</sup>	1957-59 = 100	—	106.7	107.4	108.4	108.5	—
Food	1957-59 = 100	—	105.1	105.1	107.2	106.9	—
Farm Food Market Basket: <sup>2</sup>							
Retail cost	Dollars	983	1,013	1,011	1,028	1,022	—
Farm Value	Dollars	388	374	372	388	381	—
Farm-retail spread	Dollars	595	639	639	640	641	—
Farmers' share of retail cost	Per cent	39	37	37	38	37	—
Farm Income:							
Volume of farm marketings	1957-59 = 100	—	115	159	133	175	158
Cash receipts from farm marketings	Million dollars	32,247	36,925	4,201	3,486	4,603	4,100
Crops	Million dollars	13,766	17,045	1,738	1,717	2,620	2,300
Livestock and products	Million dollars	18,481	19,880	2,463	1,769	1,983	1,800
Realized gross income <sup>3</sup>	Billion dollars	—	41.7	—	41.6	—	—
Farm production expenses <sup>3</sup>	Billion dollars	—	29.2	—	29.1	—	—
Realized net income <sup>3</sup>	Billion dollars	—	12.5	—	12.5	—	—
Agricultural Trade:							
Agricultural exports	Million dollars	4,105	5,585	574	494	571	—
Agricultural imports	Million dollars	3,977	4,011	317	338	348	—
Land Values:							
Average value per acre	1957-59 = 100	—	—	128	135 <sup>6</sup>	—	—
Total value of farm real estate	Billion dollars	—	—	148.7	154.9 <sup>6</sup>	—	—
Gross National Product <sup>3</sup>	Billion dollars	456.7	583.9	587.2	627.5	—	—
Consumption <sup>3</sup>	Billion dollars	297.3	375.0	377.4	404.5	—	—
Investment <sup>3</sup>	Billion dollars	65.1	82.0	82.8	86.5	—	—
Government expenditures <sup>2</sup>	Billion dollars	92.4	122.6	122.8	130.0	—	—
Net exports <sup>3</sup>	Billion dollars	1.8	4.4	4.2	6.5	—	—
Income and Spending: <sup>4</sup>							
Personal income, annual rate	Billion dollars	365.2	464.1	473.8	497.9	498.7	502.0
Total retail sales	Million dollars	17,105	20,536	20,558	22,254	21,362	21,265
Retail sales of food group	Million dollars	4,159	4,929	4,973	5,250	5,235	—
Employment and Wages: <sup>4</sup>							
Total civilian employment	Millions	64.9	68.8	69.2	70.3	70.3	70.7
Agricultural	Millions	6.0	4.9	4.9	4.8	4.7	4.7
Rate of unemployment	Per cent	5.5	5.7	5.9	5.2	5.2	5.0
Workweek in manufacturing	Hours	39.8	40.4	40.5	40.5	40.5	40.9
Hourly earnings in manufacturing, unadjusted	Dollars	2.12	2.46	2.49	2.57	2.53	2.56
Industrial Production <sup>4</sup>	1957-59 = 100	—	124	126	134	132	135
Manufacturers' shipments and inventories: <sup>4, 5</sup>							
Total shipments, monthly rate	Million dollars	28,736	34,774	35,004	37,312	36,664	—
Total inventories, book value end of month	Million dollars	51,158	58,807	59,780	61,019	61,584	—
Total new orders, monthly rate	Million dollars	28,374	35,036	34,953	38,018	37,698	—

<sup>1</sup> Beginning Jan. 1964, new series. <sup>2</sup> Average annual quantiles of farm food products based on purchases per urban wage-earner and clerical-worker households in 1960-61—est. monthly. <sup>3</sup> Annual rates seasonally adjusted 3rd quarter.

<sup>4</sup> Seasonally adjusted. <sup>5</sup> Revised series. <sup>6</sup> As of July 1.

Sources: U.S. Department of Agriculture (Farm Income Situation, Marketing and

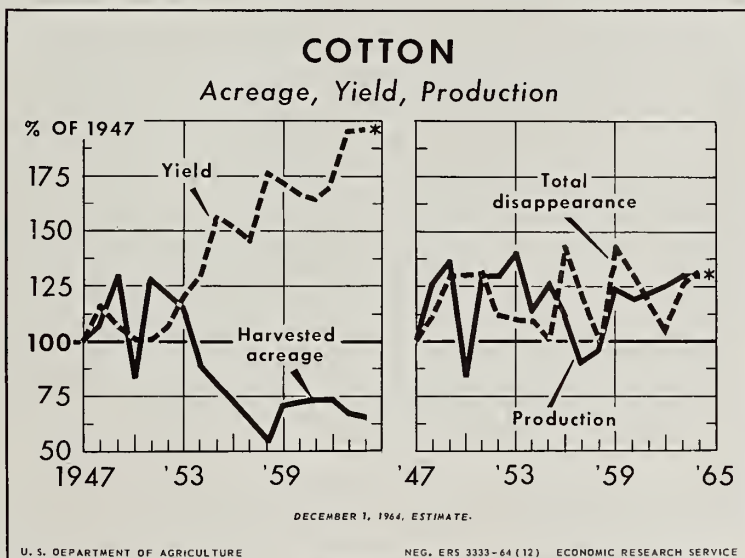
Transportation Situation, Agricultural Prices, Foreign Agricultural Trade and Farm Real Estate Market Developments); U.S. Department of Commerce (Industry Survey, Business News Reports, Advance Retail Sales Report and Survey of Current Business); and U.S. Department of Labor (The Labor Force and Wholesale Price Index).



Recent trends in crop yields show that the production potential of American farms has not yet been met—and perhaps not even approached.

Cotton farmers have supplied one of the most striking examples. In 1963, they pushed national cotton yields to an unprecedented 517 pounds per harvested acre—a remarkable 13 per cent gain from the above-average yields the year before. What's more, yields in 1963 were nearly twice as high as in the 1947-49 period.

Hardly anyone thought yields for 1964 could even match the 1963 record, much less go above it. But, the latest estimate said yields last year not only matched but surpassed the previous mark by seven pounds.



Most people had thought yields might slip a little in 1964 because the exceptionally high output per acre the previous year was attributed largely to unusually good growing weather. But, as in 1963, growing conditions were generally favorable for the 1964 crop and yields climbed accordingly.



In addition to the weather, producers stepped up their use of yield-raising techniques last year. These include the use of land better suited for growing cotton, the use of irrigation, increased applications of fertilizer and insect and weed killers and the adoption of skip-row planting.

There were 2.5 million acres planted in skip rows last year, up from 2.2 million in 1963 (1964 total planted acreage was about 14.8 million acres).

The dramatic yield increases in recent years, while desirable and beneficial to producers and consumers, have complicated efforts to match production with use.

Actual planted acreage changed very little under acreage control programs during the past several years. But, with rising yields, production went up each year. Total use dropped steadily until 1963, then rebounded.

The latest estimate puts cotton production from the 1964 crop at nearly 15.4 million bales, up slightly from the year before. Cotton use during the 1964-65 marketing year is expected to total about 15 million bales. So, the buildup in cotton stocks probably will continue.

### Flue-Cured Tobacco Acreage Cut Okayed

Tobacco growers on December 15 approved marketing quotas by a big majority for the 1965, 1966 and 1967 flue-cured crops. These quotas call for a 19.5 per cent cut in acreage allotments for the 1965 crop. This follows a 10 per cent reduction last year.

These acreage cuts are in response to a situation that is similar in at least one respect to that of cotton—skyrocketing yields. While flue-cured tobacco acreage has been greatly reduced—from over a million acres in 1954 to about 628,000 last year—yields have gone up more than 70 per cent.

# the agricultural outlook



As a result, production of flue-cured tobacco has been about steady over the past 10 years, and at a level above use. Stocks have built up until they now equal about three years of use. Because of the tobacco aging process, a supply equal to about two and a half years of use is considered normal.

**Flue-Cured Tobacco**  
Acreage, Yield, Production  
*Percent of 1950-54*

	<i>Acreage</i>	<i>Production</i>	<i>Yield</i>
1950-54 av.	100	100	100
1955	94	111	118
1956	83	107	128
1957	63	73	116
1958	61	81	133
1959	66	81	123
1960	66	94	142
1961	67	94	142
1962	70	106	152
1963	66	103	156
1964	60	102	172

About the same trends have occurred for burley, the other big-volume cigarette tobacco. Acreage allotments for burley and other kinds of tobacco will be announced by February 1.

### USDA Buys Record Amount of Beef

Fed cattle prices were higher last spring than might have been expected from price-quantity relationships in other years. Population growth, a large rise in consumer incomes and a probable gain in preference for beef added to total demand and helped clear the market of the record-large beef supply.

In addition to these factors last year, part of the beef supply was removed from regular commercial channels through USDA purchases for distribution to schools and other institutions and to needy people.

These beef purchases were by far the largest ever made by USDA in a single year. They began in March. For the year as a whole, they totaled about 388 million pounds of frozen and canned beef at a cost of more than \$215 million. March-October deliveries under purchase programs equaled about 3 per cent of commercial beef production—enough to shore up cattle prices.

### More Citrus Indicated This Season

Total citrus production in the 1964-65 season is expected to be up 18 per cent from the small crop the year before which suffered from after-effects of the freeze the previous winter.

Growers expect larger crops of oranges, grapefruit, tangerines and limes, but fewer lemons and tangelos. The orange crop is up 22 per cent, with the early, mid-season and Navel varieties and the Valencias up sharply. The Florida orange crop is much larger than last year while the California crop is down.

Production of grapefruit is expected to be 19 per cent greater than the 1963-64 crop. The gain is due mostly in Florida, although the Texas crop is larger, too.

### Potato Stocks Are Down from Last Year

December 1 stocks of fall potatoes were the lowest in several years. Stocks were estimated at 118 million cwt., 15 per cent below a year earlier. Prices have been at record-high levels for several months.

Production forecasts for 1965 winter potatoes indicate a crop 2 per cent smaller than 1964 and 11 per cent below average. The California crop is smaller because of reduced acreage, but Florida acreage and production will be larger.

Growers of early spring potatoes indicate an increase in acreage of 13 per cent from last year. The larger acreages are in store for both Florida and Texas.

### New Demand for Tom Turkeys Emerges

Institutional feeders such as hotels, restaurants and hospitals prefer tom turkeys to hens. They find these heavy turkeys yield more meat and are less costly to process and prepare. Until recently, these users had the market for toms largely to themselves.

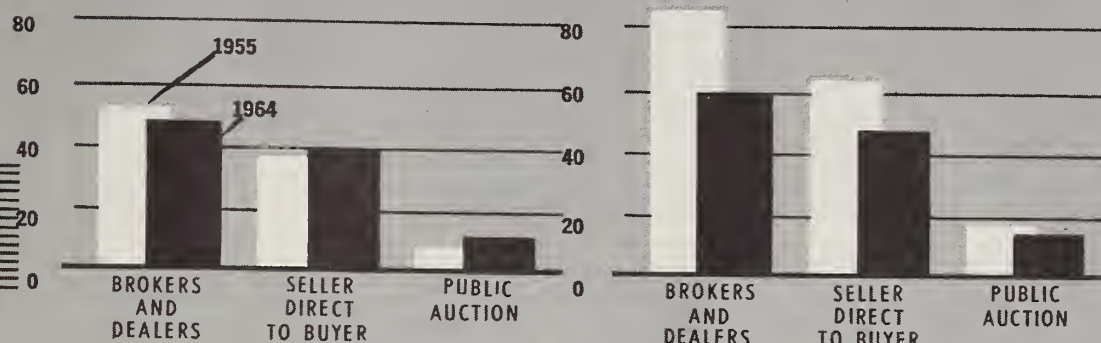
But today, the market for toms is much broader, thanks to increasing production and use of convenience products made from turkey meat, as well as to the increasing use of turkey parts. Turkey parts, rolls, pot pies and the like have opened up a new household market for meat from tom turkeys. Data from federally inspected poultry plants show that about 17 per cent of all turkey meat certified in 1964 was used in convenience products, compared with only 8 per cent in 1961.



## HOW FARM REAL ESTATE IS SOLD

% OF SALES

THOUS. SALES



## METHODS OF SALE

ESTIMATED VOLUNTARY SALES PLUS ESTATE SETTLEMENTS. YEARS ENDED MARCH 1, 48 STATES.  
U.S. DEPARTMENT OF AGRICULTURE

NEG. ERS 3337-64(11)

ECONOMIC RESEARCH SERVICE

## THE TOLLS OF TRANSFER

*Buying a farm or other real estate usually takes more than just a downpayment—buyer and seller must figure on a generous outlay for an array of transfer costs, too*

### FARM FOR SALE

200 A.  
150 tillable, 45 in woodlot. Farmstead consists of sound barn, six-room dwelling and outbuildings. Immediate possession. Owner asking \$45,000.

The farmer who buys this property will find, if he hasn't bought real estate before, that the \$45,000 isn't all the money he will have to put out. Nearly all transfers of real property involve fees and costs which either increase the buyer's outlay for the purchase or come out of the seller's proceeds from the sale.

Some costs of transferring real estate are required by state and local laws; others are voluntary. Some are paid by the seller; others by the buyer. In some instances, fees and costs are shared by both parties. Just who does pay them depends partly on logic, partly on custom and partly on bargaining strength. A survey of local real estate people in March 1964 covered some of these points.

Transferring property may involve three kinds of costs—settlement costs, broker's commission (if this method of sale is used) and loan fees (if the purchase is

financed). The total costs of the transaction to both the buyer and the seller usually range from less than a hundred dollars to several thousand, depending on what the sale price is and how complex the transfer becomes.

Settlement costs of one kind or another fall on almost all transfers of real estate. They include the buyer's prorated share of real estate taxes and property insurance, fees for title search, abstracts of the title, title insurance, surveyor's fees, notary fees, documentary stamps and recording fees.

Most of the settlement costs are due to the seller's responsibility to deliver a "merchantable title" to the property when the sale becomes final. The abstract of the title, a documented history of previous transfers, is usually prepared at the seller's expense.

A search of the title is often advisable, too. This will show if there are any "clouds" on the title (unsatisfied claims of heirs, unpaid taxes or outstanding liens). Two-thirds of the respondents in the 1964 real estate survey said the buyer normally paid this cost in their localities.

Insurance can be bought to safeguard the property in a lawsuit over the title. For the U.S. as a whole, the study found that the buyer paid the title insurance premiums about half the time. The seller footed the bill in the remaining cases.

Although relatively small in cost, the federal and state documentary stamps, state and county transfer taxes and recording fees also are part of the charges when transferring property. Results of the survey indicated that the seller usually paid for federal stamps at 55 cents per \$500 of sale value.

Some states have stamp requirements, too. In areas where state stamps and state and local transfer taxes were in effect, the seller tended to pay the state fees and the buyer the county or city costs. The fee for recording the new title was almost always paid by the buyer.

When selling a farm property, the owner usually has three choices—list it with a real estate broker, sell it himself by advertising in newspapers and farm magazines or hold a public auction. The real estate survey indi-



cated that about half of all voluntary sales of farm real estate throughout the country from March 1963 to March 1964 were completed with the help of a broker. By and large, the typical commission rate was 5 per cent of the sale price.

Thirty-nine per cent of the farms that changed hands voluntarily during the survey were sold by the owner. This method of sale is usually best suited for a farmer who has lived in the area long enough to become familiar with farm values and is likely to know of local people who are in the market for a farm.

Public auctions accounted for the remaining 12 per cent of farms sold during the survey period. They involve a commission to the auctioneer or broker who does the advertising and handles the sale and are a quick and convenient way to dispose of livestock and equipment along with the farm. Auctions frequently are used in cases where several heirs want to settle an estate. Sometimes the owner of a large property can get more money by auctioning the land in a number of parcels.

Over four-fifths of all transfers of farm property involve some sort of financing, either by sellers through installment contracts or by loans from commercial lenders.

When loan funds are obtained from a bank or insurance company, there may be a separate appraisal fee and a charge by the loan agent for processing the mortgage in addition to a recording fee.

Typical loan appraisal fees reported in the survey ranged from \$10 to \$50, depending on the time needed to make the appraisal and on the amount of the loan. Most loan agents asked 1 per cent of the mortgage for their services.

In cases where the buyer assumes the seller's mortgage, the only expenses are for preparing the mortgage papers and the recording fees. (1)

## Combination of Ideal Climate and Soils Boost Land Values in Calif. and Fla.

Sunshine and oranges. That combination easily conjures up the names of two states, California and Florida, in the minds of most people. However, the same combination also makes for land values in these two states that are unlike those in most other states with a high proportion of farmland.

In early 1964, specialists in ERS gathered information on the market values of farm real estate in California and Florida from surveys of real estate men and farmers. Here are some of the results.

*California.* Because of wide differences in elevation, temperature, rainfall and soil, California has a considerable range of land uses, often within a single county. As a result, almost all field crops grown elsewhere in the U.S., as well as most fruits and nuts, can be produced in the state.

But many of the same conditions that make farming so productive also attract new industries and residents. The rapid growth of population and the resulting pressure for land for housing developments and industrial sites have forced the market values of farmland in many areas substantially above what they would be

worth for agricultural use alone.

The bearing orchards, vineyards and groves had the highest value of any major class of land surveyed—an average of \$2,600 per acre—in the March 1 survey in 1964. The 1.2 million acres devoted to fruit crops represented only 3 per cent of land in farms, but the total value was \$3.1 billion, 19 per cent of the value of all farmland and buildings in the state.

Land used for vegetable production at \$1,450 per acre was second to orchards and the like. The value of irrigated land used for other field crops ranged between \$600 and \$1,000 per acre.

Market values for all major classes of land in California were reported to have advanced in the year ended March 1, 1964.

*Florida.* Citrus groves dominate the total value of farmland. With a weighted average value of about \$2,500 per acre, the nearly 700,000 acres of bearing and non-bearing orange and grapefruit groves were estimated to be worth close to \$1.8 billion on May 1, 1964. This was about two-fifths of the total value of all farmland and buildings.

Two-thirds of the citrus acreage in Florida in mid-1963 was groves of bearing age (five years or older). They averaged \$3,112 per acre in value, a total of over \$1.4 billion. The remaining citrus acreage was in young trees.

Many Florida respondents noted at the time of the survey that the values of groves varied more than usual because of the December 1962 freeze. Groves that escaped damage or were completely recovered in May 1964 would command a higher price than those that had been partly replanted or had lost much of their ability to produce.

Although some citrus acreage in Florida, particularly in the interior and on the west coast, is located near expanding urban areas, the effect on land values is much less than in California. (2)

### Farm Tax Bite

Taxes levied on farm real estate in 1963 totaled a record \$1,468 million, up 5 per cent over the 1962 bill.

The increase in tax rates in 1963 exceeded the rise in market value of privately owned farm real estate. As a result, the effective rate of taxation on real farm property went up—from \$1.02 per \$100 of assessed value in 1962 to \$1.03 in 1963.

The average tax per acre in 1963 was \$1.43. It was \$1.36 in 1962. (3)



## High-Level Prices for Natural Proteins Favor Using Urea as Feed Supplement

Urea is a nitrogen compound produced from carbon dioxide and ammonia. It is used in agriculture as a fertilizer and as a source of protein for cattle and sheep. Urea in industry goes into the manufacture of plastics.

Small wonder then, that manufacturers' sales of all urea in 1963 came to over a million tons, nearly three times the 1956 figure.

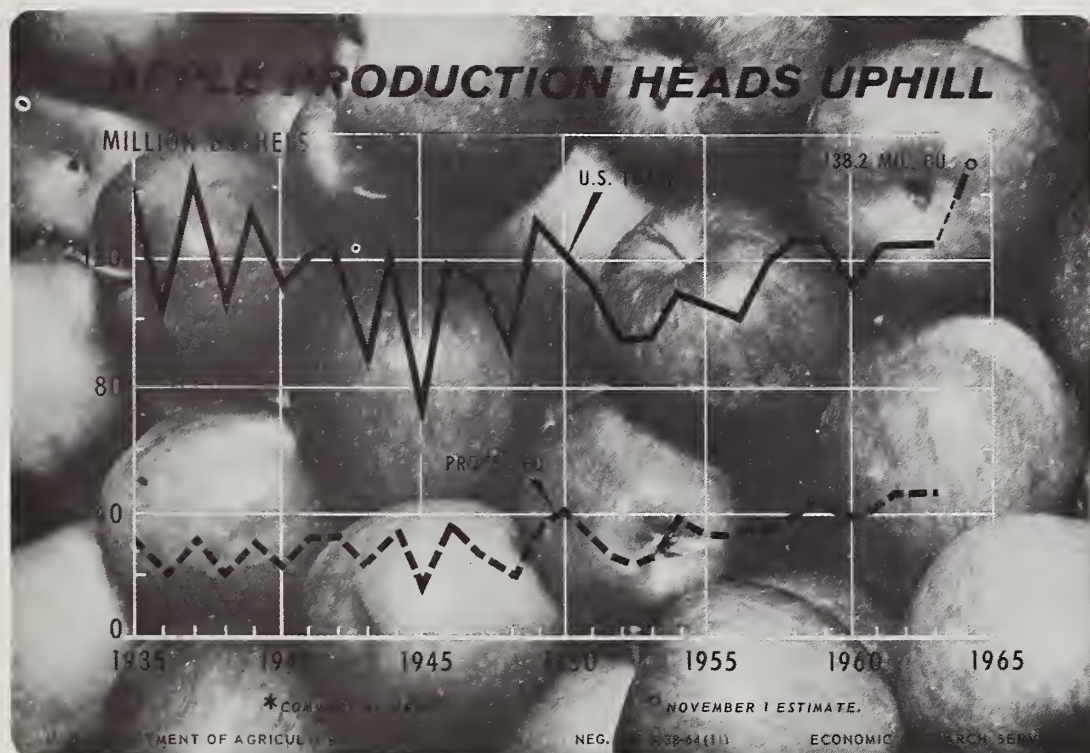
About 80 per cent of the urea produced in the U.S. is sold for fertilizer, 13 per cent for feed and 7 per cent for industrial uses.

Sales of urea for feed have gained sharply since this outlet reached a commercial scale in the early 1950s. The 142,000 tons sold in 1963 is the equivalent of about 760,000 tons of 44 per cent protein soybean meal.

Urea is fed only to ruminants. The bacteria in the rumen convert the nitrogen to usable protein. Urea alone contains no energy so molasses or grain is usually fed with it. Most nutritionists recommend that no more than a third of the total protein in a complete ration be replaced by urea. As an example, in substituting urea for an oilmeal, 7 pounds of the meal are replaced by 1 pound of urea plus 6 pounds of corn.

Despite a number of limitations in feeding urea, the chief advantage is in preparing less costly rations in periods when prices of natural protein are high in relation to the prices for cattle, sheep and dairy products. Price comparisons of a corn-urea mixture and soybean meal at Chicago during the past 13 years indicate that in the mid- and late 1950s, there was less advantage to feeding urea than during the past three years.

Since 1960, soybean meal prices have increased more than those for corn. As a result, the corn-urea mixture gained in favor with livestock and dairy farmers. (4)



## Apple Production to Expand Into 1970 With Processing Taking Larger Share

Attention—all apple growers, processors, handlers and consumers! Here's the word on apple prospects for the next five years or more.

**Production.** Output of apples in the U.S. is expected to trend up, especially in the major apple producing states of Washington, New York and Michigan. After declining in the preceding 20-year period, apple output increased a little from 1953 on.

The prospective gain in production is based on the many young trees planted during the 1950s and early 1960s. Plantings are likely to continue large, too. Yields per tree will be higher due to the improved varieties set out and better methods of caring for orchards. Many of the new trees are dwarf types which can be planted closer together. They also mature sooner and bear more bushels per acre than do the standard varieties.

The No. 1 apple variety planted since 1950 is clearly the Red Delicious, according to a fruit tree census in leading apple producing states. The Golden Delicious,

Rome Beauty and York are runners-up, followed by the Jonathan, McIntosh and Stayman varieties.

**Marketing.** Processing of both canned and frozen apple products (particularly applesauce, apple slices and apple juice) probably will take an even larger slice of the crop in years to come. In 1935, the volume of apples processed was about a fourth of total sales. In 1963, processed products took 38 per cent of the apples sold. Canned applesauce and apple juice have gained popularity in recent years and have the brightest outlook.

As long as apples are in large supply, part of the crop likely will be exported, especially when production is light in western Europe and Canada.

**Consumption.** Use of both fresh and processed apples per person can be expected to gain a little during the next half decade. Americans probably will eat even more applesauce and drink even more apple juice. This will continue the trend of past years when these two products led the gain in use of processed apples.

However, the expected increase in the amount of fresh apples eaten per person is contrary to a gradual decline in recent years. (5)



*Maintaining an “attractive nuisance”  
is one way a farm owner may extend . . .*

# AN INVITATION TO SUE

Time was, a farm pond was just a pond. Nowadays, if a trespassing toddler wanders out on your wooden pier, topples into your boat and breaks his arm, your pond isn't necessarily just a pond anymore. It may be an “attractive nuisance,” and you may be held liable for the toddler's injury.

In most cases a prudent farmer is not held responsible unless proved negligent in an injury claim, but he may still have to defend himself in court. The possible list of claims against a farmer has been made longer by what insurance people describe as a growing claim consciousness among people everywhere.

A farmer may be held liable for acts of his employees: For instance, if he permits an unskilled driver to haul day laborers to and from the farm and one of them is injured because of the driver's failure to observe ordinary safety rules of the road.

Suppose his animals break out of a fence he has failed to keep properly repaired and they injure someone or stray onto a highway and cause a wreck. In both cases, the farmer runs the risk of a negligence suit.

If a farmer sells milk, he could be sued for damages if the milk becomes contaminated and harms a customer. Sometimes he can be held responsible for an injury incurred during construction by an independent contractor, if the contractor has no insurance or resources of his own or if the farmer maintains some control over the construction work, which he usually does.

Another factor has increased liability risks to farmers. Today's larger farms have correspondingly larger assets to protect as

well as an increased use of complicated power machinery, itself a big factor in increasing serious farm accidents.

The farmer, as his own risk manager, needs to set up a definite program to protect himself and his farm against the risks that he cannot ordinarily bear. He should take three steps, as a minimum:

(1) Eliminate or reduce the physical hazards on his farm. County agricultural agents have hazard checklists that provide a good start. If the farmer can't completely eliminate a hazard, he should post signs or put up fences to reduce the chance of injury.

(2) Consider ways to transfer


to someone else the risks that are beyond his control. Contractors doing work on the farm should be asked to sign a “hold-harmless” agreement or warranty to protect the farmer from injury claims. This agreement is insurable by the contractor.

(3) Buy insurance that will take care of the farmer's personal liability on and off the farm as well as to cover the business phase of his operations. Even if he makes a reasonable effort he cannot eliminate all risks. An insurance policy provides for defense in court in the event of a suit. This in itself can be a big help. The policy pays indemnities including medical expenses for bodily injury and for property damage when so listed in the contract. The average farmer should carry a minimum of \$25,000 liability insurance for bodily injury.

In states where they are exempted from the compulsory pro-

## THE MEDICINE GAP:

There were only 52 physicians or surgeons for every 100,000 persons in rural areas in 1960. The ratio was 178 to 100,000 in big cities. In places of 2,500 inhabitants or more outside densely urbanized areas (“other urban” in table below), the ratio was 126 to 100,000. Dentists, too, prefer to live in town. There were only 22 for every 100,000 rural residents, compared with an average of 60 for all urban areas. (7)

Occupations		Personnel per 100,000 population, 1960					
		United States	Urban			Rural	
			Total urban	Urbanized areas			Other urban
				Central cities	Urban fringe		
		Number					
Dentists:		48.5	60.0	51.8	74.4	57.8	21.9
Salaried		4.6	5.7	5.9	5.8	5.2	2.0
Self-employed		43.9	54.2	45.8	68.5	52.5	19.9
Dieticians and nutritionists		15.1	17.7	19.9	15.0	16.7	9.2
Nurses, professional:		329.3	387.3	413.4	354.1	378.8	194.7
Government		79.0	87.7	86.7	74.3	107.0	58.8
Other		250.2	299.6	326.6	279.8	271.8	135.8
Optometrists		9.0	11.5	9.6	10.7	16.2	3.2
Osteopaths		2.2	2.6	2.0	2.6	3.8	1.4
Pharmacists		51.7	63.9	63.9	62.7	65.5	23.3
Physicians and surgeons:		128.4	161.2	177.6	163.3	126.3	52.4
Salaried		45.1	58.0	76.9	51.2	29.4	15.1
Self-employed		83.3	103.2	100.6	112.0	96.8	37.2
Technicians, medical and dental		78.8	97.4	112.5	85.9	82.4	35.8



visions of the Workmen's Compensation Act, farmers should consider voluntary coverage. This type of insurance fits farming situations where there are a number of employees operating heavy farm machinery.

Within the past 10 years, insurers have been selling so-called package policies which include several kinds of insurance in one contract. The *farmowner's policy*, for example, combines property damage coverage for fire, lightning, and windstorm and certain allied causes (vandalism, malicious mischief, some losses of livestock, theft and collision damage), as well as comprehensive personal liability.

The most complete liability insurance protection for the farm operator is provided by the recently developed *farmers' comprehensive personal liability policy*. It protects him against claims that might be brought by visitors, employees, and customers, as well as claims that result from construction work being done under his control or through an independent contractor.

It does not cover nonfarm businesses. If a farmer wants to include protection against liability growing out of a recreation enterprise such as a hunting, fishing or camping facility, he would need a special endorsement to the FCPL policy or a separate *owner's, landlord's or tenant's policy*.

The OLT general liability policy is not, however, limited to nonfarm businesses. It can be written to cover most of the same risks as the FCPL.

In deciding on the policy and special options that best fit his own operation, the farmer should discuss his program with an insurance agent and with neighboring farmers to get the best advice possible. And he should keep in mind that liability insurance is best used when it protects a farmer against the chance of a judgment too big for him to handle out of his own resources. (6)

## The Face of the Countryside Changes As New Faces Appear in the Big City

For every stream of migrants leaving an area there's usually a counterstream coming in. The streams seldom have exactly the same characteristics, so the social complexion of the area changes.

ERS and Iowa State University studied a statewide sample of 457 houses to find the effects of migration on the open country population of Iowa. ("Open country" was defined as that area not included within the boundaries of towns and cities.)

All persons who changed houses were classed as migrants, even if they only moved across the road instead of across the state or United States. Occupancy histories of the sample houses were obtained by interviews with the current occupants in August 1961.

A total of 1,376 persons had moved into these houses from January 1950 to August 1961. During the same period, 1,580 had moved out. Most moves were for a short distance: 85 per cent intrastate; 68 per cent intracounty; 42 per cent intracommunity.

Although the "outs" exceeded the "ins" by 204 persons, total population was 18 persons greater at the end of the period than at the beginning. Natural increase—the excess of births over deaths in the total population, migrants as well as permanent residents—made the difference.

The net effect of migration on this sample of open country population was to lower the average age, increase the proportion of younger families and the size of households (mean of 3.48 persons in 1950; 3.68 in 1961), lower the educational level and increase occupational homogeneity (by increasing the proportion of farm operators in the labor force).

Because migration rates are highest among young and middle-aged adults, net out-migration usually increases the median age

of the population. But this didn't hold true for the open country Iowa sample. Instead, the average age dropped.

This was partly because many older people moved to town or retired to another state. But more importantly, the single boys and girls who left were more than offset by the number of young families with preschool or school age children who moved in. The median age of all in-migrants was about 21 years, compared with 23.6 years for out-migrants. Even the children of the "ins" were younger; their median age was 6 years, while the median age of "out" children was 7.4 years.

Another effect of the population interchange was to lower the general educational level. Although the educational level of the "in" and "out" household heads was similar, the single people who left were significantly better educated than the single people who came in. Eighty-three per cent of the single persons who left had high school diplomas; only 56 per cent of the new arrivals had them. The effect was magnified because the number of single persons who left was more than double the number who came in.

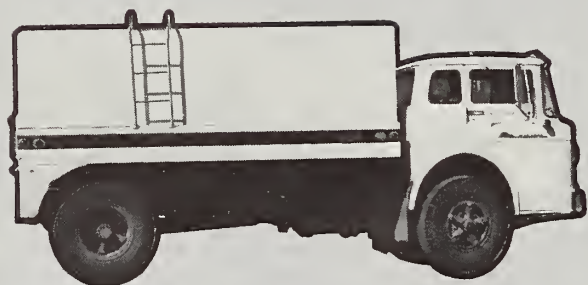
As for the net changes in occupation resulting from the interchange of population, the paid farm laborer category saw the most dramatic shift. Because of net out-migration, the number of farm laborers in 1961 was only half as large as it might otherwise have been.

The number of nonfarm wage workers would have been 22 per cent higher without the movement that took place. But, the number of farm operators would have been only 2 per cent higher, and the number working in nonfarm businesses and professions would have remained the same.

The aggregate effect of all these changes was to increase the proportion of farm operators, already the largest category by far at the beginning of the period. (8)



## ONE STOP BUYING CUTS INTERCITY MILK HAULING COSTS



Month	Intercity milk shipments	Potential transportation saving
		Ton miles
January	302,588	48,499
February	308,326	36,300
March	366,054	47,302
April	650,044	113,784
May	844,672	77,886
June	686,444	44,738
July	631,369	55,322
August	441,685	30,790
September	295,286	22,454
October	292,459	23,624
November	228,693	18,702
December	279,358	24,750
<b>TOTAL</b>	<b>5,326,977</b>	<b>544,150</b>

## A CENTRAL SUPPLY FOR DAIRIES?

*Producer milk reserves might solve two problems that beset dairies: The need to keep a surplus on hand to carry firms through peak periods and the corresponding need to get rid of excess milk when demand slackens*

The big bulk tank truck rumbles through the night, hauling fresh milk to the city. The driver blinks his lights in greeting to the oncoming vehicle, another tank truck, this one outbound from the city with surplus milk. Its destination? A butter and powdered milk manufacturing plant near the milk assembly point from which the inbound truck had started.

Instances of cross-hauling of the same high quality milk occur infrequently. But it does happen. And it serves to illustrate a real problem in the dairy industry: How to control the flow of milk from farm to dairy to consumer, or to manufacturer, so that there's always enough for everybody—but not *too* much.

Time was, all dairies were on their own when it came to lining up farm sources of supply and finding manufacturers of butter, cheese, dry milk and other dairy products to take any surplus.

Some dairies still use this

method but it has its drawbacks. The basic problem is the milk cow doesn't understand economics and can't be conditioned to produce a supply exactly equal to demand, also a widely fluctuating factor. For example, dairies need more milk for retail sale on weekends than earlier in the week. People tend to drink more milk in winter, the very season when milk production is lowest.

In order to fulfill its obligation to the public, every dairy in town that procures milk independently has to keep a reserve supply. This is not only costly for the dairy; it's an uneconomical use of an important commodity.

A new ERS study of the Tulsa-Oklahoma City milk marketing area, the first of several areas to be studied, shows that it's more economical if dairies use a centralized source of supply. Such a centralized source is the producer cooperative—the dairy farmers themselves.

In practice, the centralized

source of supply eliminates the need for each dairy to keep reserves or worry about disposing of surpluses. The co-op fulfills these functions. Each dairy simply buys what it needs on a day-to-day basis.

Because the co-op keeps a pooled reserve for a number of dairies, the reserve can be smaller than the total of individual plants. The study shows the reserves needed for supply variations for just seven dairies could be reduced 56 per cent by central pooling.

Manufacturing plants making butter and other dairy products benefit too, by getting a more uniform supply of surplus milk direct from the co-op. Combining supplies not needed by six participating dairies produced at least 30,000 pounds of milk about two days out of three. This is the smallest volume that's economical to ship on to a manufacturer. Individual dairies had this much surplus milk only one day out of eight.



Moreover, central supply coordination can reduce costs of intercity milk shipments in Oklahoma by 15 per cent.

Finally, central supply offers savings in the cost of quality control. Each dairy that procures its milk independently has to have field men who visit dairy farms to check and improve, if needed, the quality of milk produced.

With the co-op handling field service for several dairies it takes fewer men. It improves producer-buyer relations as well, since it removes the dairy firm from the position of being at once a policeman and a customer. (9)

## Hides May Try for Market as Food As Industry Seeks to Increase Sales

If they won't buy them to wear, maybe they'll buy them to eat.

That is the theory behind a new study of markets for cattle hides.

Specialists in the Economic Research Service looked at the potential of a new edible product that uses fresh cattle hides as raw material. The product is a casing for such processed meats as pork sausage.

This development promises to open a whole new world of sales for the otherwise nearly valueless belly portion of cattle hides.

It also points the way to more profits for the hide and leather industry, which faces stiff competition from synthetics in its traditional outlets.

The growing use of leather substitutes in handbags, luggage, upholstery, garments and especially shoes has reduced our needs for cattle hides. In fact, almost a third of U.S. cattle hides now go overseas in search of markets.

The ERS economists saw that a new market for the low value belly portion of hides would help take the supply pressure off the industry.

One firm, working with the ERS specialists, has found a way to separate the corium, or middle

layer of a fresh hide, and turn it into tubing for sausage. But once the economists demonstrated a market potential for hides in such casings they had to solve yet another problem: how to process the belly portion of the hide so that it could qualify for use as an edible product.

Their solution: cut off the belly portion of the hides before they leave the killing floor in the packing house. (Hides that go to the hide cellar become inedible because of possible contamination.) The packer tags the cut-off portions for later identification by carcass source, washes them thoroughly and freezes or chills them for shipment to the processor.

Tagging makes it possible to eliminate any pieces that come from carcasses rejected by the inspectors as unfit for human consumption.

When the hide reaches the processor for use, it is stripped of the outer, hair-root layer and the fleshy underside that carries the fat cells, leaving only the inner corium layer.

The corium with its rich supply of protein molecules can then be made into meat casings.

The market potential for hides as edible products is largely unexplored. But the low cost and high quality of the hide protein suggest that uses beyond meat casings will be readily found. The casings themselves are already coming into commercial use.

All the various uses of meat casings might well take as many as 36 million belly sections a year by the end of this decade. But that would take care of only about half the volume that might be available.

The industry thus faces yet another question: Where will the remainder of the potential supply of the belly sections be sold in 1970?

The market researchers say that other products now being analyzed show good promise as future markets. (10)

## Consumers Clip to Save; Retailers See Frozen Orange Juice Sales Jump Fast

"Clip the coupon from this newspaper ad. It's worth 21½ cents on a 6-ounce can of frozen orange juice. Other coupons are good for a 5 cent discount on the 12-ounce size."

Using this sales promotion technique on a nationwide basis, 22 Florida processors upped sales of frozen orange juice by 2.5 million gallons from September 1 to December 15, 1962, compared with the same period in 1961, for total sales of 25.5 million gallons.

To increase sales this much usually takes a retail price reduction of at least 3 cents on the 6-ounce can, a loss of \$16.8 million on a volume of 25.5 million gallons. The producer-advertisers in this campaign didn't reduce the retail price outright, offering a discount only to customers who redeemed coupons.

When you consider that the advertising campaign cost only \$3.5 million vs. \$16.8 million for reducing the price by 3 cents, the producer group saved themselves \$13.3 million.

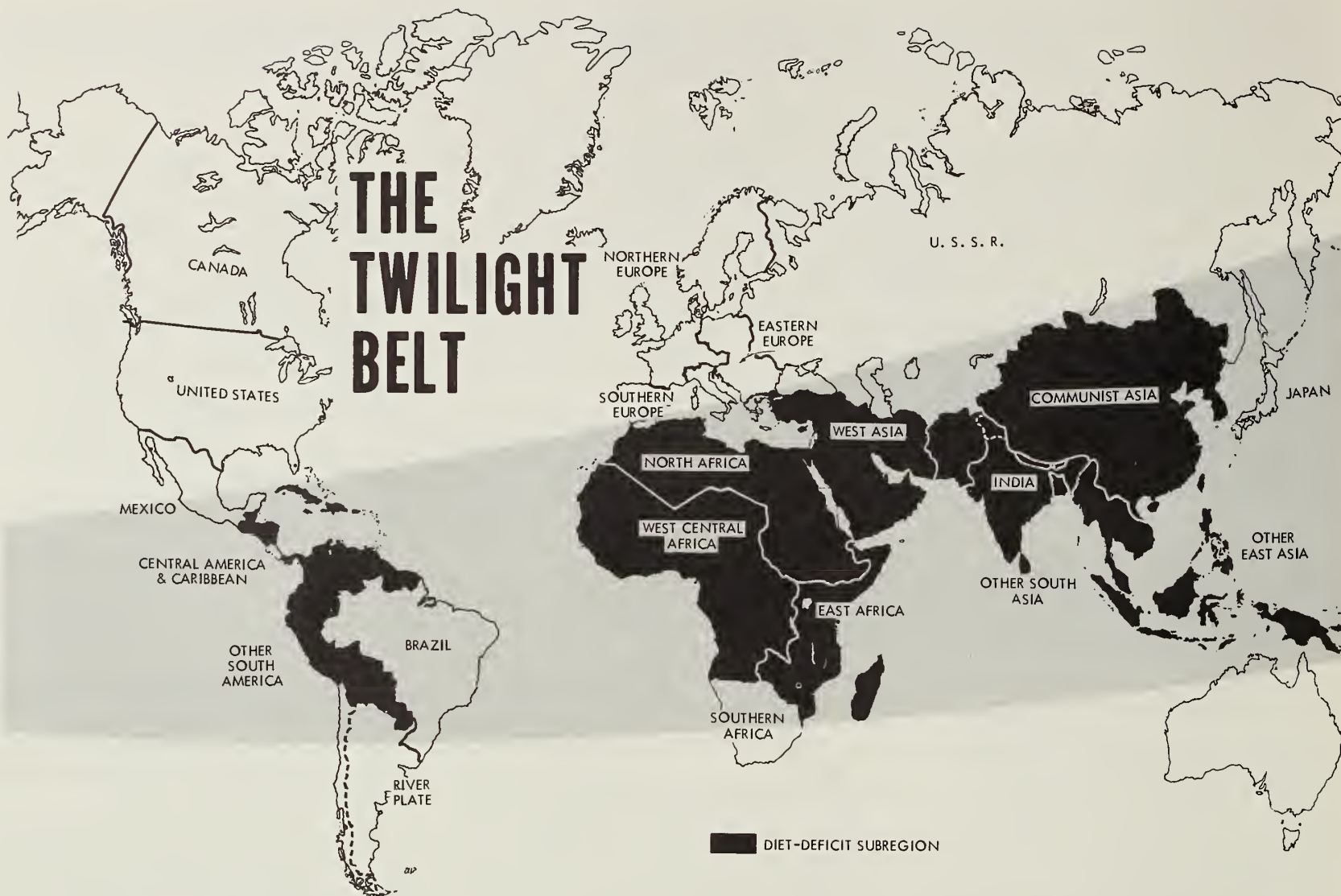
The Florida producers ran the coupon campaign in the fall of 1962 in an effort to move an unusually large orange crop. This, of course, was before the disastrous December freeze.

Sales in the September-November campaign period were 18.4 per cent above the June-August level.

True, people normally buy more frozen orange juice in the autumn when fresh fruits are no longer plentiful. ERS economists estimate 9.3 per cent of the 18.4 per cent rise was due to seasonal demand.

Another 1.5 per cent can be traced to a slight decline in price that occurred between the two periods. The remaining 7.7 per cent sales increase can be traced directly to the promotion campaign. (11)





## FOOD OUTLOOK TO 1970

*A little  
more to eat,  
but not enough  
to satisfy*

A single pat of butter. One egg. One-fifth cup more rice.

These three items represent the total increase expected by 1970 in the average daily food supply per person of some 2.4 billion people.

This is the population estimated for 1970—a half billion more than in 1960—in regions where the average diet is short of foods required for adequate nutrition.

These diet-deficit regions include all of Asia (except Japan and Israel), all of Africa (except the southern tip), the northern part of South America and nearly all of Central America and the Caribbean.

Small as it is per person, this step-up in food supplies by 1970 is, in the aggregate, a sign of substantial progress:

—One pat of butter per person, times 2.4 billion people, means 26 million pounds of butter (or

equivalent in another fat) will be available every day, 365 days a year. This daily increase is equal to the entire annual butter production of Illinois. And it's in addition to the amounts consumed at the beginning of the 1960s.

—One extra egg per person, of course, will take 2.4 billion more eggs (or other protein equivalent) a day. This is equal to an entire year's egg output in Ohio.

—One-fifth cup more rice will require 246 million pounds more rice (or other source of calories) a day. This daily increase will consume in a single week the equivalent of Louisiana's annual rice crop.

These figures are based on ERS projections in *The World Food Budget, 1970*. This detailed study projects, by country and region, world food production and consumption five years hence. It



uses 1959-61 averages as the base period or take-off point. Since the study is concerned only with the world food outlook, it does not project output or use of cotton, wool, tobacco and other nonfood commodities.

Specifically, the study shows people in the diet-deficit world by 1970 will add to their diets 13 per cent more fat, 10 per cent more protein and 8 per cent more calories. In other words, they will have only 8 per cent more food (the increase in calories) but it will be better quality, including more protein foods and more fats.

Despite the improvement, the average diet in food-short countries won't come close to meeting needs.

For example, an 8 per cent increase in calories will still leave the average person with some 275 calories a day less than he should have for adequate nutrition. Emphasis here is *adequate*, not good. The study measures the diet in each deficit country against a minimum standard of nutrition.

It's impossible to assess the food gap in terms of human aspirations, except to say that in 1970 residents of deficit regions

will still have some 800 calories less a day than those in diet-adequate regions—basically Europe, North America, Japan, Australia and New Zealand.

The threat inherent in a food gap this large is not the pressure exerted by starving people—there is little starvation anywhere—but by people who aspire to eat better in an increasingly prosperous world. Most won't make it by 1970. In fact, about 80 per cent of the world's people will still have to rely on starchy foods for more than two-thirds of their total calories.

Looking at the deficit in terms of representative commodities, the study shows the calorie gap will equal 54 million metric tons of grain. The deficit in animal protein will run around 6.5 million tons of nonfat dry milk; the deficit in pulses and other protein, about 3.2 million tons of soygrits. It will also take some 3.1 million tons of vegetable oils to fill the fat deficit.

Total cost of this deficit? \$6.8 billion.

Big by any measure, the 1970 deficit will still be a vast improvement over the 1959-61 base period when the gap stood at \$10.7 billion. This narrowing of the gap

will be due chiefly to larger imports from the U.S. and other surplus producers. Without U.S. aid there would be almost no improvement in diet in the food-short regions by 1970.

Total U.S. food shipments to the deficit world, both in trade and aid, are projected to climb to \$2 billion; nearly \$1.3 billion will be aid shipments under the Food for Peace Program. This program currently accounts for over 90 per cent of *all* food aid extended by *all* countries and international agencies to *all* deficit regions.

So the \$6.8 billion gap is what will remain in 1970 even after surplus producers have substantially increased their exports to food-short countries.

Communist Asia, with teeming populations growing ever bigger and agriculture only about recovered to prewar levels, will have nearly two-thirds of the total 1970 deficit—\$4.3 billion.

While Communist China has bought large quantities of grain from free world sources in the last two years or so, it has made no overture for aid.

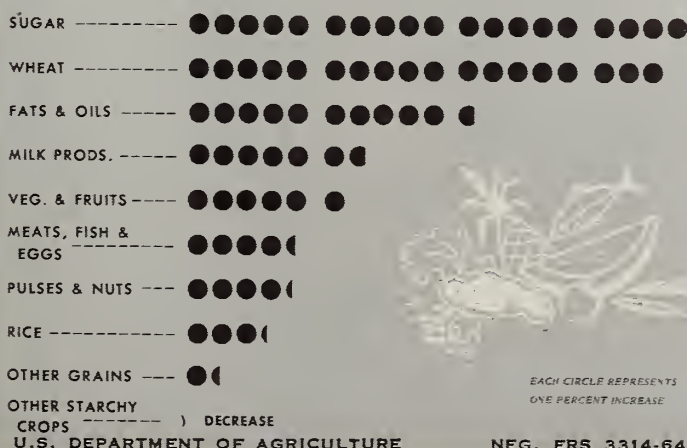
This leaves the free world with a \$2.5 billion gap. Here's the per-

**BETTER BILL OF FARE.** People in diet-deficit free world will get a little more of most all foods by 1970. Such high quality foods as milk, vegetables, meat and eggs will gain considerably. Sugar, an energy source, and wheat, a protein source, will show the greatest increases.

**GAP SMALLER AT \$6.8 BILLION.** By 1970 imports will help food-short regions narrow the \$10.7 billion gap of 1959-61. In East Africa each person will need by 1970 only 27 cents more food a year for minimum nutrition. In Communist Asia it would take \$5 apiece—for 847 million people.

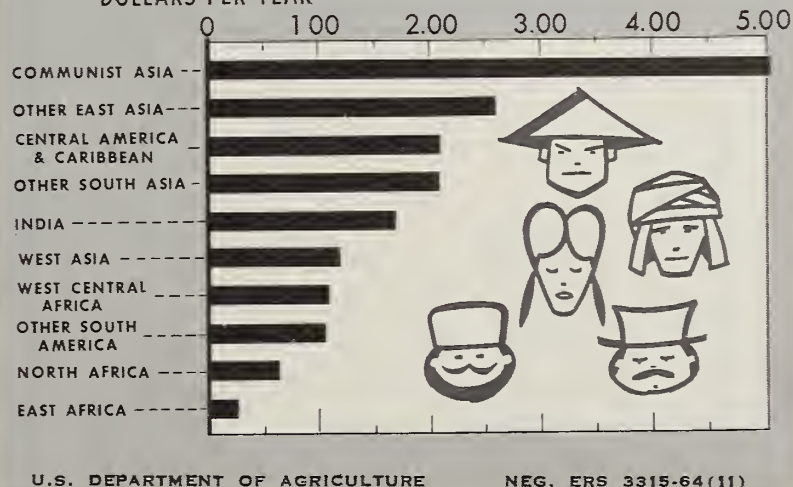
#### PEOPLE IN FOOD-SHORT FREE WORLD WILL EAT BETTER FOODS BY 1970

PER CENT CHANGE PER PERSON 1959-61 TO 1970



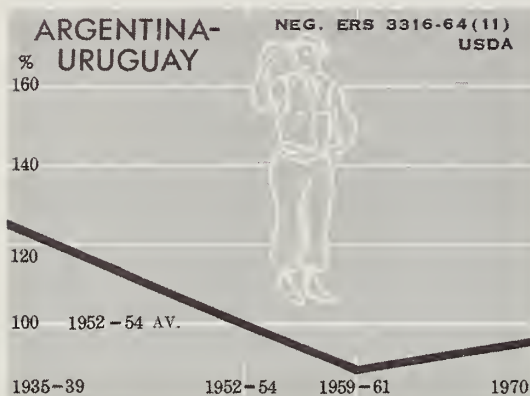
#### WHAT \$6.8 BILLION DEFICIT WILL COST PER PERSON BY 1970

DOLLARS PER YEAR

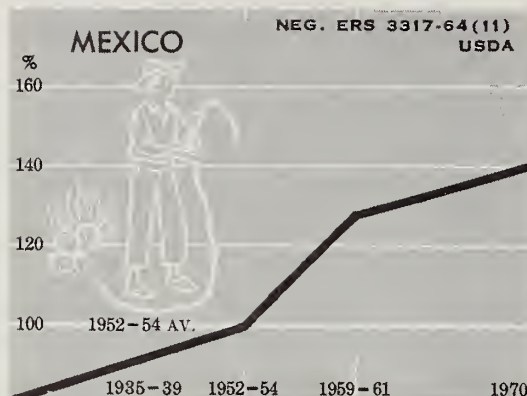




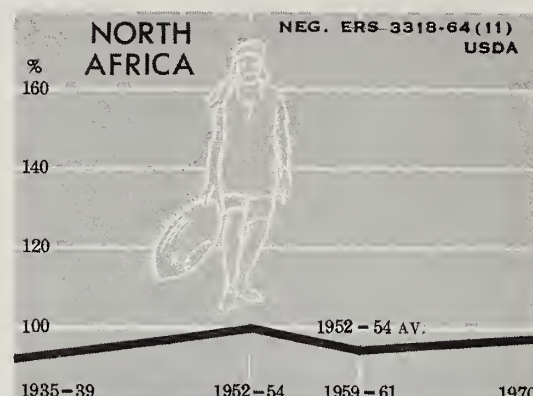
## Index of food output per person, prewar to 1970 . . .



Abundant resources but no progress



New areas irrigated, higher yields



Limited resources, progress difficult

centage and per capita breakdown by subregions:

Subregion	Share of deficit	Deficit per capita
	Per cent	Dollars
Central America and Caribbean	1.3	2.10
South America (excl. Brazil, Argentina, and Uruguay)	1.0	1.05
North Africa	1.0	0.64
West Central Africa	2.1	1.07
East Africa	0.3	0.27
West Asia	1.7	1.17
India	13.2	1.69
Other South Asia	5.0	2.07
East Asia (excl. Japan)	12.0	2.61
Communist Asia	62.4	5.04

What are the chances of closing the \$2.5 billion free world food gap in a single decade?

Three possibilities occur: Slowing the population growth rate, more food imports or more output in the deficit regions themselves.

Despite the persistent pressure of population on the food supply, few diet-deficit countries have limited the growth of population.

Most successful is Japan. By the late 1950s a postwar program of education in family planning had helped to drop the population growth rate below 1 per cent a year.

India has also launched a family planning program, but few peo-

ple believe it will appreciably lower the growth rate in this decade.

In India, as in many other countries, a large family has meant economic security for the parents in old age. Actually, family planning clinics in the early stages may well reduce child mortality and spur a further rise in population.

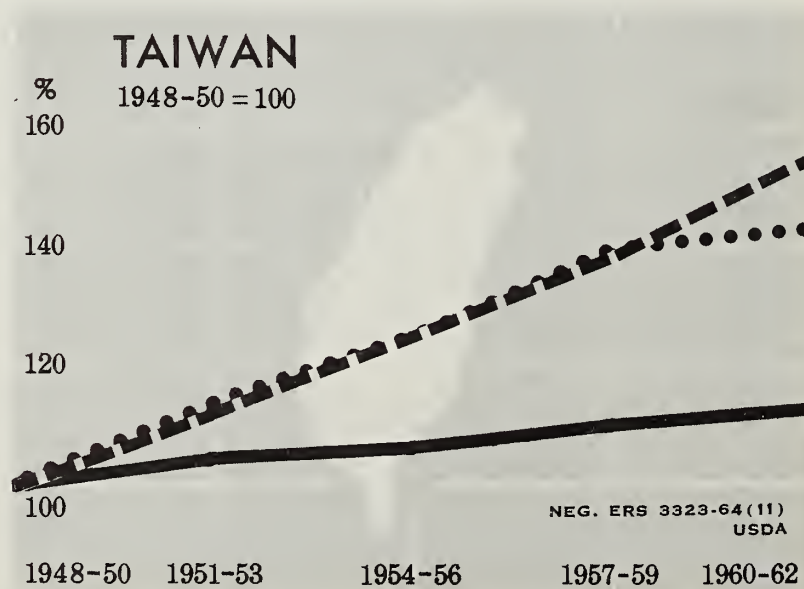
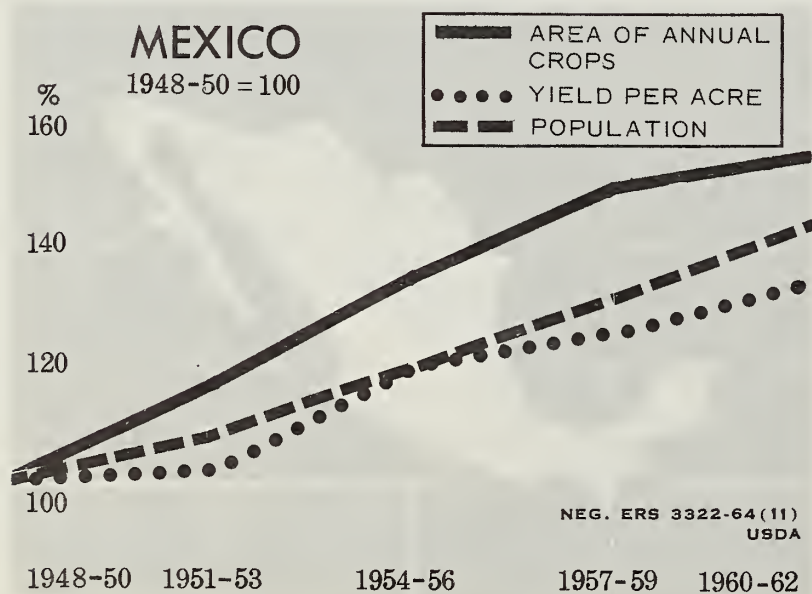
Filling a gap this size with imports isn't practical. Most deficit countries by 1970 still won't have the port facilities, storage and distribution systems to handle much more than they are already projected to receive.

The gap, if it is to be met, will

## With more land or higher yields . . .

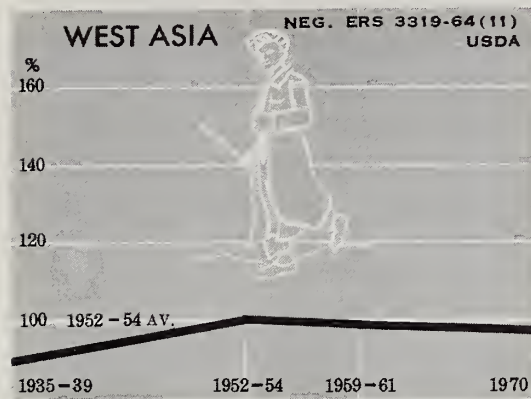
Mexico has kept well ahead of population growth by irrigating large tracts of dry land, using better seeds and more machinery.

Insular Taiwan has upped yields markedly by double, even triple, cropping. Still population has forged ahead in the last six years.

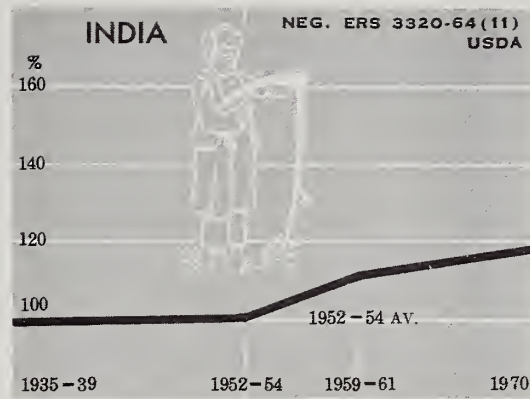




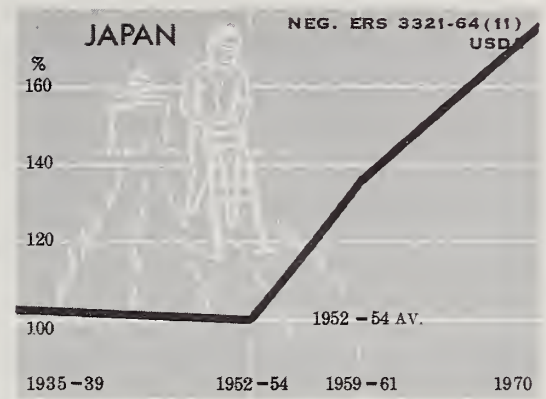
## POPULATION HOLDS THE STOPWATCH



Traditional agriculture slow to improve



Progress largely offset by population



Agriculture booming with rest of economy

have to be met from considerably higher output in the very areas where food is shortest.

The fact that the ERS study projects a \$2.5 billion gap shows that deficit regions are not expected to raise output fast enough to fill it. The study assumes modest progress in upping yields and total output. But modest progress is not enough with populations swelling rapidly.

Much has been written about the countless barriers to agricultural progress in food-short countries—poor income, poor education, poor roads, not enough arable land, unequal taxation, not enough incentive for the small

farmer to better his lot.

*The World Food Budget* points to another barrier—piecemeal planning. Concentration on heavy industry is not a magic carpet to economic development. In most countries concentration on agriculture is a more logical starting point.

What is actually needed, however, is a rounded development program that makes the most of a nation's human and physical resources.

Before a comprehensive program can be developed planners need a host of facts and figures. A fact-finding organization is a vital first step.

But the most crucial need of all, the study says, is a reasonably stable and reliable government. Economic development is a long-term business.

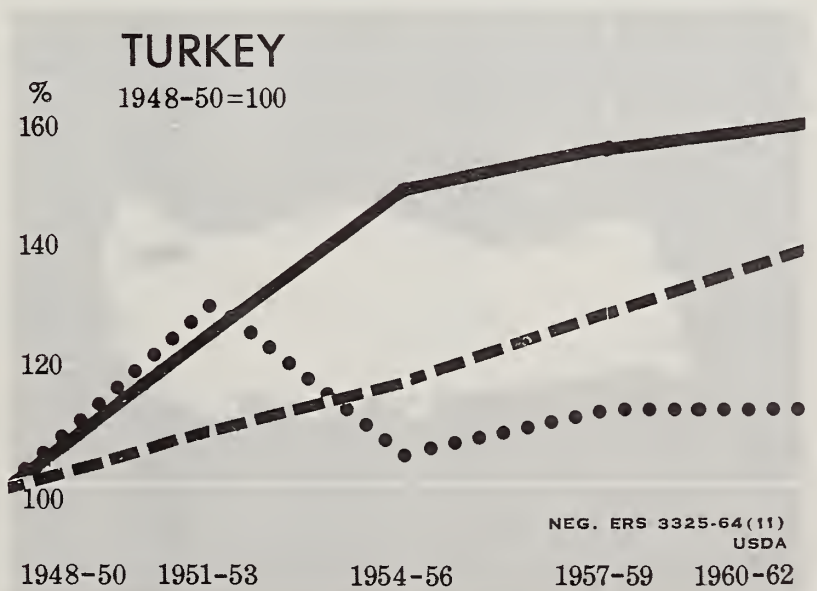
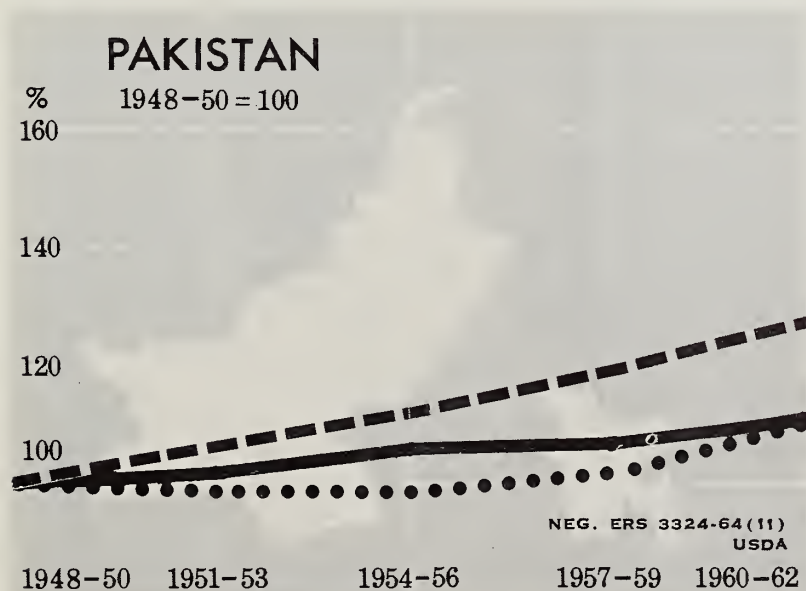
Most emerging nations have as a minimum a five-year development program. Forward-looking decisions can't be made or implemented in a political climate where government leadership is apt to change abruptly.

The world already has the technology to help food-short countries raise yields enough to meet their needs. Some adaptation of plant varieties and farm techniques will be needed for climates and terrains as varied as the rain

## SOME KEEP AHEAD OF POPULATION, SOME DON'T

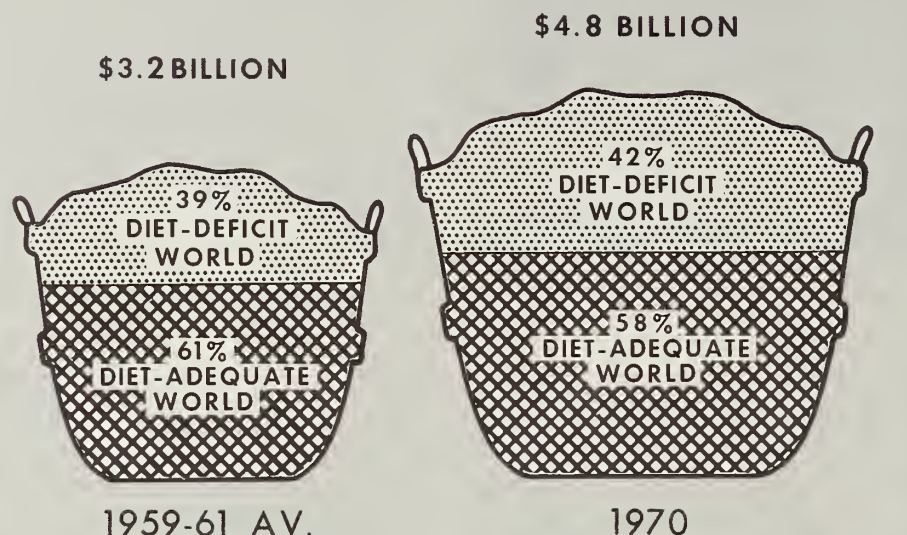
Pakistan's greater stress on agricultural development since 1958 has raised yields somewhat. But population is consistently ahead.

Turkey in the 1950s planted much new but marginal land to crops. Low yields in these areas plus drought have retarded national yield rise.





## FOOD SHORT COUNTRIES TO GET LARGER SHARE OF LARGER U.S. EXPORTS



U.S. DEPARTMENT OF AGRICULTURE

NEG. ERS 3326-64 (11)

**HIGHER AID EXPORTS WON'T APPROACH DOLLAR SALES.** U.S. food exports are projected to rise 50 per cent in this decade. Destinations will shift somewhat, with diet-deficit regions getting 3 per cent more of total shipments (see above). Exports to North Africa alone will increase 65 per cent, to South America, 63 per cent. About two-thirds of food shipments to food-short countries will be made under aid programs. Aid shipments will expand a half billion dollars over 1959-61 for a 1970 total of \$1.8 billion. Nevertheless, most food will go abroad as trade, not aid (see below). As in past years, dollar sales by 1970 will account for about two-thirds of total food shipments.

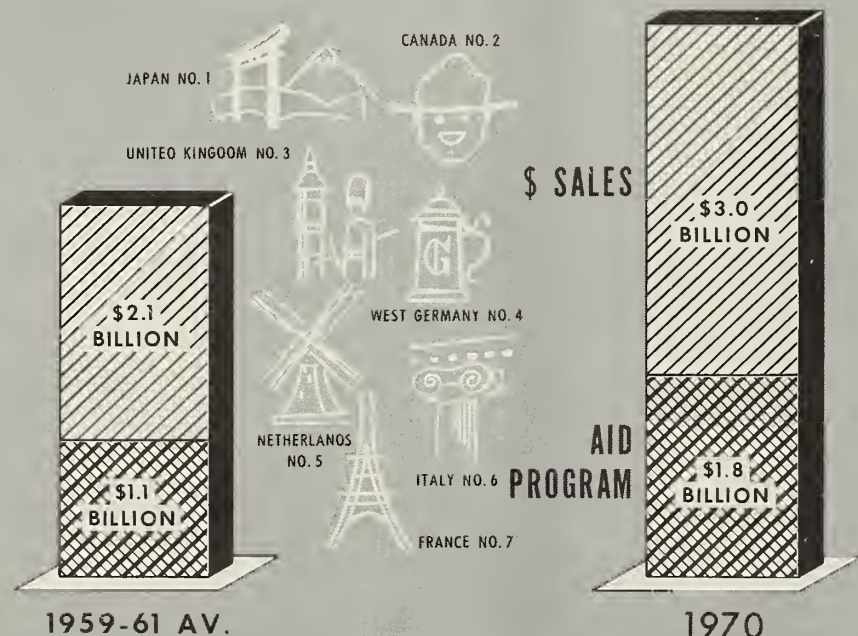
forests of the Ivory Coast and the Rajasthan Desert of India.

A few countries can still tap unused arable land to increase the food supply. Mexico has irrigated much new land in the past decade, with a rapid production increase. Taiwan, with limited land resources, has done it by raising yields and double or even triple cropping.

Summing up, then, the steps to betterment are known. Europe, North America and other developed regions have learned by trial and error how to assure the food supply of a billion people. It took a long time to develop this vast pool of knowledge. It should take less time to adapt it to the specific conditions of today's twilight belt countries.

In essence, the twilight belt is both a place and an attitude. Geographically, it is the belt of food-short nations ringing the earth's middle. Psychologically, it is the "no man's land" separating what *will* be done from what *could* be done. (12)

## MOST U.S. FOOD EXPORTS STILL DOLLAR SALES BY 1970



U.S. DEPARTMENT OF AGRICULTURE NEG. ERS 3327-64 (11)

TOP U.S. DOLLAR MARKETS 1963

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**INDEX OF WORLD FARM OUTPUT TO CLIMB SLIGHTLY IN 1965  
BUT NO PER CAPITA GAIN <sup>1</sup> (1952/53-1954/55 = 100)**

Region	Total production				Per capita production			
	Average 1935-39	Revised 1962/63	Preliminary 1963/64	Estimates 1964/65	Average 1935-39	Revised 1962/63	Preliminary 1963/64	Estimates 1964/65
Canada	70	121	132	124	94	97	104	96
United States	69	117	121	120	85	101	103	100
Latin America	72	132	136	133	103	103	103	98
West Europe	81	123	125	126	92	114	115	115
Soviet Union	102	139	131	143	104	121	113	121
Other East Europe	119	127	126	128	118	117	115	117
Australia-New Zealand	78	134	141	143	103	111	114	114
Far East <sup>2</sup>	88	134	137	139	111	111	111	110
West Asia	68	133	139	137	93	105	107	102
Africa	80	131	133	136	107	107	106	107
World <sup>3</sup>	85	125	127	128	102	105	105	104

<sup>1</sup> Value of production at constant prices. Crops included in the index are harvested mainly between July 1 of the first year shown and June of the following year. For a few crops and most livestock production, estimates

are for the calendar year of the first year shown. <sup>2</sup> Excluding figures for Communist Asia. <sup>3</sup> Including estimates for Communist Asia.

## 1965 WORLD FOOD SITUATION

The world food outlook for 1965 is about what it's been the last two years or so: somewhat more food produced, but not enough to keep ahead of population growth. Result? No progress in upping per capita consumption.

A split year running from July to June is used in estimating farm output because the Northern Hemisphere harvests come in the summer and fall, followed by the Southern Hemisphere the next winter and spring.

Biggest news of the current season is the agricultural comeback of the Soviet Union and Communist China.

With better weather and more fertilizer applied this year than last, Soviet production is estimated at 9 per cent above 1963/64. On a per capita basis, however, Soviet output is well below 1958/59; it's merely regained the ground lost during the 1963/64 fiasco. (See The Farm Index, March 1964.)

Similarly, Communist China is

expected to have the best harvest this season since 1958, the year "the great leap forward" began to push economic development too far too fast and farm output plummeted. Even with a much improved harvest, the Chinese diet in 1965 will remain well below the 1957 level, which was itself inadequate.

Free world production this year is running at about last year's levels, with Western Hemisphere declines about offsetting gains elsewhere. Drought has caused a 3 per cent drop in North America's crop production, particularly feed grains. Crops are good in Mexico and Central America but poor to fair in most of South America and total production for Latin America will be down from 1963/64.

Last year was a good one for Africa; this year total output will be 2 per cent better. However, most of this increase is in the Republic of South Africa and in Nigeria.

West Asia is having a bad year mostly because of lower grain output in Turkey and Iran, the two big agricultural nations. For the first time in the 1960s, West Asia's total farm production is down, 1.5 per cent below 1963/64. Per capita output is off 5 per cent.

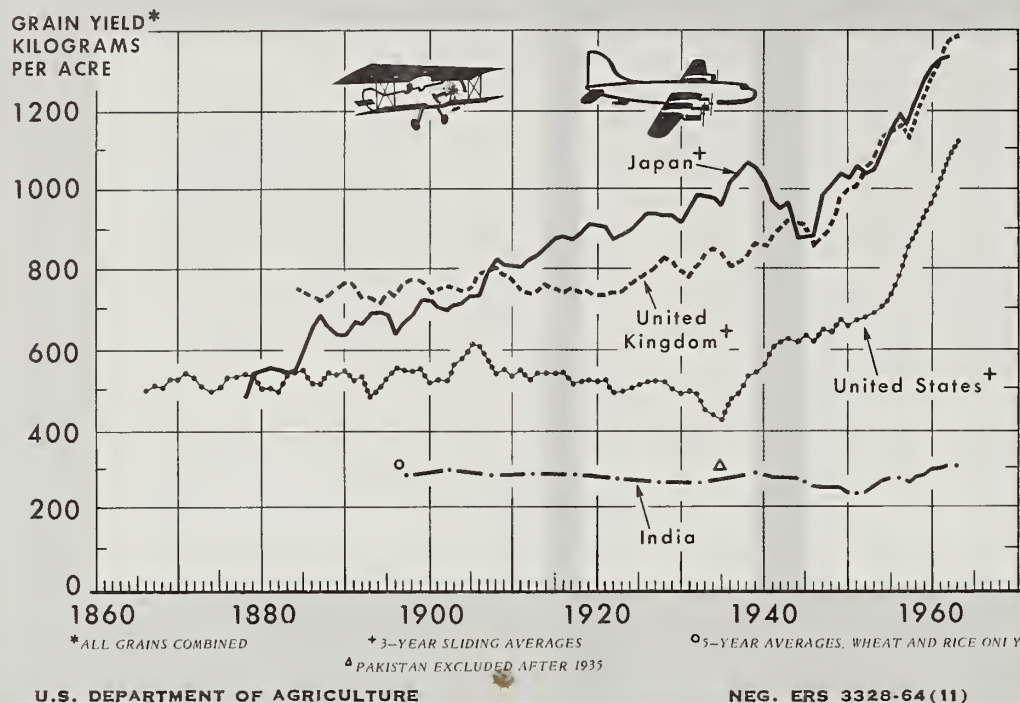
The Far East's production climbed only 1.5 per cent this year while population shot up nearly 2.5 per cent. Food shortages have occurred in India.

Gains in Western Europe are small, even though half the countries are likely to set new records.

The way population growth has offset steady gains in agricultural production since prewar can be seen in the tables above. Total production has climbed from a prewar index of 85 to an estimated 128 for 1964/65. Yet per capita output, reflecting the population explosion in less developed regions, has hovered only 2 to 5 percentage points above the prewar average throughout the first half of the 1960s. (13)



# FIRST WORLD WAR FAILED, SECOND BROUGHT U.S., U.K. YIELD TAKE-OFF



**WHAT UNKNOWN SPARK?** With normal trade disrupted, war generates a need for higher domestic output of food. Farm prices rise, giving farmers more incentive to raise yields. Yet neither the United States nor the United Kingdom was able to up grain yields markedly during or even after World War I. Whatever factor was missing had been found by World War II. Grain yields in both countries began a dramatic take-off that still continues. Japan's take-off dates from the turn of the century. Less developed nations such as India have not yet achieved a yield take-off.

## PREPARATION FOR PROGRESS

By the year 2000 the world's food-short regions—most of Asia and Africa, parts of Latin America—will have to produce *three times* the amount of food they did in 1960.

This is what it will take to feed projected populations in Asia, Africa and Latin America of 5 billion-plus—and to give each person about 20 per cent more food than he had in 1960.

A 20 per cent increase, however, probably won't come close to satisfying the rapidly rising aspirations in the developing countries. But it's about the minimum increase people in emerging nations looking toward a better life are likely to accept.

These conclusions appeared in a 1963 study by ERS of world food needs at the end of the century. (See *Man, Land and Food: A Hard Look Ahead*, The Farm Index, October 1963.)

A sequel to that study now considers the question: Do the food-short regions have the land and other resources to triple food out-

put by the year 2000?

There is little new land that can readily be brought under cultivation in most of the densely populated, less developed countries. A marked increase in food output in deficit regions will require a *yield take-off*—a sustained gain in yields per acre of at least 1 per cent a year.

*The World Food Budget* projects modest progress in raising yields and consequently total production by 1970 (see page 12). Modest progress, however, should not be mistaken for a yield take-off.

Few food-short countries have as yet achieved a yield take-off.

Why not?

To get the answer, the study examines the case histories of four of the nations that *have* achieved a yield take-off. The four studied were the United Kingdom, Australia, the United States and Japan.

Examination reveals that in three of these four advanced nations the main factors for a yield

take-off were favorable many years before the take-off was actually accomplished. Most people were literate. Personal income was adequate. Cash markets for farm foods were already established. Industry was advanced enough to supply an expanding agricultural sector.

Of the four, only Japan achieved a yield take-off in the late 19th century. It was another half century before the United States, the United Kingdom and Australia followed suit.

Japan, it should be noted, was a special case. An insular society with virtually all arable land under cultivation, Japan, recognizing early that higher yields were essential, began a concerted drive to raise yields. When the nation was unified for the first time—in 1868 under the Meiji restoration—a strong central government was able to extend the trial-and-error progress of a few adventurous farmers to the entire agricultural economy.

Until the early 20th century the



## EDUCATION NEEDED TO RAISE YIELDS



% CHANGE IN WHEAT YIELDS PER  
ACRE, 1935-39 TO 1960-62



U.S. DEPARTMENT OF AGRICULTURE NEG. ERS 3329-64 (11)

**LITERACY, NECESSARY BUT NOT ENOUGH.** Countries where few people can read and write have made slow, if any, progress in raising yields. Iraq has the same yields today it had prewar; Tunisia has actually lost ground. Even after most people become literate it takes years for results to show up in a nation's agriculture. Late arrivals among the high literacy nations, such as Chile and Italy, still haven't upped yields appreciably. Moreover, while literacy is an important factor for success, it can't in itself solve the food problem in deficit regions.

need for a yield take-off wasn't pressing in the United Kingdom, Australia and the United States.

The United Kingdom, of course, was the birthplace of the Industrial Revolution, which sparked a rise in per capita income in the latter part of the 18th century. Thereafter, the English had little incentive to raise agricultural production because they could profitably exchange their technological lead in the form of manufactured goods for food and raw material.

There was likewise little pressure to raise yields in the United States; until the early 1900s frontier land for farms was still there for the taking. The same was pretty much true in Australia.

Then came World War I. The need for higher food output became acute in all three countries. Food prices soared, an added incentive for farmers to produce more food by raising yields.

Despite this favorable economic climate, not one of the three nations succeeded in achieving a yield take-off. It took another generation, another war, to succeed.

Yield take-offs in the United States and the United Kingdom coincided with World War II. The yield take-off in Australia came about mid-century.

The study suggests that one of the missing links in 1914-18 may have been adequate agricultural research. Another may have been farmers' lack of confidence that farm prices would remain favorable once the war was over.

What emerges from the study's analysis of the United Kingdom, the United States and Australia is that each failed, in World War I, under *very favorable* conditions. Each succeeded, during or shortly after World War II, only under the *best possible* conditions.

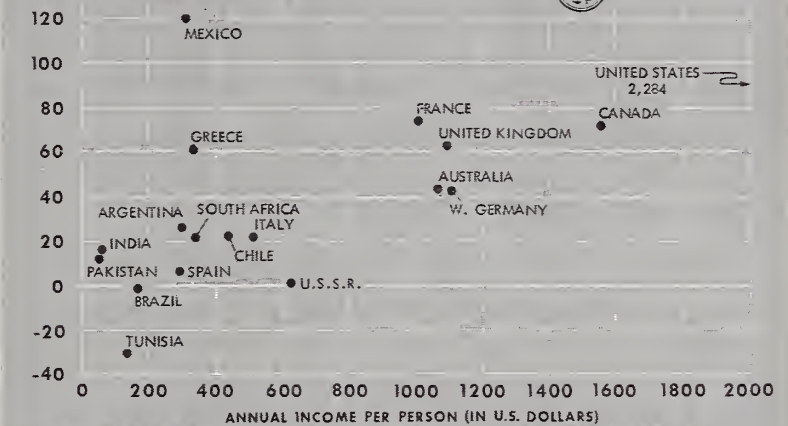
Conversely, food-short countries will be trying to achieve a yield take-off in the years ahead under less than favorable conditions:

—Many are tropical. Most countries that have managed a yield take-off thus far have been in the temperate zone, where most of the world's agricultural research has been conducted.

## IT TAKES MONEY TO RAISE YIELDS



% CHANGE IN WHEAT YIELDS PER  
ACRE, 1935-39 TO 1960-62



U.S. DEPARTMENT OF AGRICULTURE NEG. ERS 3330-64 (11)

**ADEQUATE INCOME NEEDED.** No country with per capita income below \$200 a year has made much progress in raising yields. Mexico, where government-sponsored irrigation projects have been the big factor, has been most successful among middle-income countries (\$200-\$400). Every producer with per capita income above \$1,000 has made impressive gains. Even if farmers have the education and know-how to raise yields, they can do little about it without the money or credit for fertilizer, pesticides, better seeds and equipment.

—Cultural practices are relatively primitive, in some places much like those that man first used when he began the transition from hunter to tiller.

—Population is growing much faster than it ever did in the now advanced countries that have achieved a yield take-off.

—The land available per person for food—the land-man ratio—is only a fraction of what it was in the now advanced countries at a comparable stage in their development.

—Mass emigration, Europe's traditional escape valve against population pressures, is not available as a solution for food-deficit countries.

Aside from the physical environment, there must be a suitable economic and social climate before a less developed nation can move up the economic ladder or, in the study context, achieve a yield take-off in agriculture.

The study examines four of the elements of success:

**LITERACY.** The United States launched its yield take-off in the



1940s with 95 per cent of the population literate.

Asia and Africa will be attempting a take-off with only about a third of their people able to read and write. Latin America is more fortunate with about two-thirds of its population literate.

Judging from the number of school age children presently enrolled in school, literacy levels won't be much improved for the upcoming generation. In Africa only 38 per cent of school age children are now attending classes. The figure for Asia is 51 per cent. Again, Latin America shows more promise with a 79 per cent enrollment.

Agricultural workers will have to communicate with a large part of this generation—and the next—by word of mouth. India alone has over 60 million farmers, most of them illiterate. Even when they learn to read and write, the communications problem will be

only a shade less staggering. Pamphlets and periodicals showing farmers how to raise yields will have to be translated into India's 16 major languages.

Yet there is an undeniable correlation between levels of literacy and increases in crop yields. The new ERS study shows the relationship in the world's major rice, wheat and corn producing countries.

In 25 grain producing countries where less than half the people could read and write, the average rate of yield increase was 0.17 per cent a year from 1935-39 to 1960-62. In 13 countries where 50 to 80 per cent of the people were literate, the average yield increase was higher—1.12 per cent a year. And among 23 major grain producers with 80 per cent or more of the population literate, the yield rate was highest of all—1.43 per cent a year.

ADEQUATE INCOME. The United

States achieved its yield take-off with per capita income already around \$1,000 a year.

Today 11 of the 13 leading rice producers, mostly in Asia, have a per capita income of less than \$150 a year. Comparing yield increases with increases in income since 1935-39, the study shows that no low income producer has made outstanding headway in upping rice yields. In some cases, yield gains in the late 1940s and early 1950s were actually just a return to levels attained before World War II. In effect, wartime damage to crop production has been erased, but little genuine yield improvement has accrued in many countries.

The study makes the same income-yield comparison for the world's major wheat producing nations. The six big producers with per capita income of more than \$1,000 a year—West Germany, France, Canada, Australia, the United Kingdom and the United States—have raised wheat yields markedly since prewar. Annual compound rates of increase range from 1.5 per cent in West Germany and Australia to 2.7 per cent in the United States.

Wheat producers with incomes under \$200 a year increased yields at an average rate of only 0.18 per cent a year.

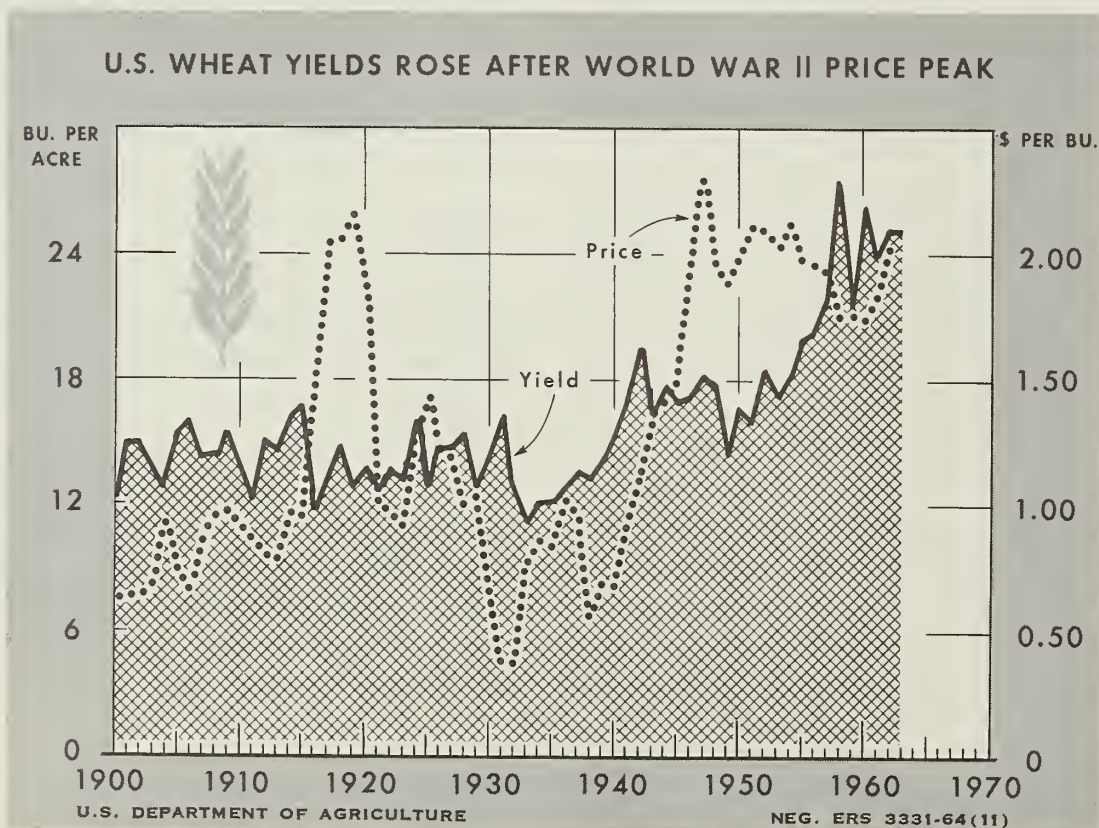
Corn yields show the same trend, with the United States way out in front.

CASH MARKETS. At the time of the U.S. yield take-off in the 1940s, 90 per cent of farm produce was sold through commercial channels. This meant farmers had the cash income to buy fertilizer, improved seeds, pesticides, weed control.

Although reliable figures aren't available, it's likely that in many less developed countries farmers market less than half of their crop. The rest is consumed at home. As a result, few farmers have the money to buy inputs that would raise yields.

SUPPORTING CAST. Backing up

**INCENTIVES: FARM PRICES AND SOCIAL REFORM.** While a food-short country should have favorable factors before a yield take-off can occur, several incentives are needed to launch the take-off. One is attractive prices for the food farmers grow. The U.S. experience shows that wheat yields began to climb only after prices went up in World War II. U.S. yields have climbed steadily since. Aside from good prices, deficit countries also need effective government programs to carry out land tenure and tax reforms—social changes that link effort and reward.





the U.S. yield take-off was an economy that could provide all the goods and services required—everything from fertilizer and farm implements to transportation, credit and research.

In an advanced economy, agricultural research is one of the most vital services that industry renders to farmers. In the U.S. today private industry—from machinery makers to feed dealers—invests more in research to improve farming than does government at all levels. In countries where industry can't afford such research, the job has to be done by government.

A country lacking a strong agricultural supporting cast will likely find it difficult, if not impossible, to generate a yield take-off.

**INCENTIVES.** In addition to the favorable factors which are described above farmers need such economic incentives as favorable prices for what they grow, such social incentives as land and tax reforms.

The yield take-off in the United Kingdom and the United States was spurred by good prices during World War II food shortages. Australia's success was due in part to a similar price situation during the Korean conflict.

Farm prices actually need to be relatively higher in a less developed country than in an advanced one. With few if any chemical fertilizer plants, the country has to import most of its fertilizer. The added transportation charges are included in the cost to the farmer. Many other capital inputs are similarly more expensive.

Unlike the literacy problem, which may take generations to solve, government programs to support farm prices can have a fairly rapid effect in giving farmers the incentive to raise yields.

Government action is also required to bring about land and tax reforms.

In sum, the ERS study shows the food-short regions face two severe handicaps in making the

transition from land expansion to yield expansion as the solution to the food gap.

First, the food-short regions have very little time in which to make the transition. They will have to raise yields faster than have most of the advanced countries such as the United Kingdom or Japan.

Second, they will have to make the transition at a far earlier stage in their economic development than did the United States and the other advanced countries of the industrial West.

Meanwhile, the yield gap between the advanced food-adequate regions and the less developed food-short regions is widening. For instance, India's rice yields today are equal only to those Japan achieved around 900 A.D.

The yield gap, not to be confused with the overall food gap, is the difference between countries in *output per harvested acre*.

Among the major rice producers, the ratio between the highest and lowest acreage yields was 3 to 1 prewar; by the early 1960s it was 4 to 1. The wheat gap widened even more, from 5 to 1 prewar to 10 to 1 in recent years. For corn, the third major food grain, the ratio of 4 to 1 went up to 6 to 1.

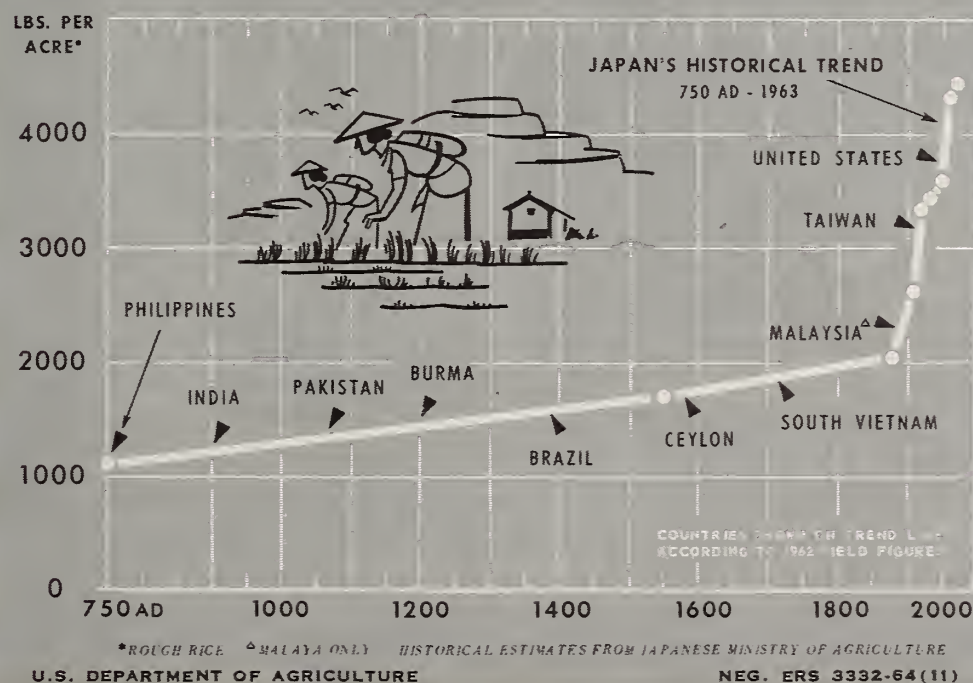
A yield take-off is essential if food-short regions are ever to feed themselves adequately. Yet the present yield gap is indicative of considerable slippage.

How to cope with a population of 5 billion-plus only 35 years from now—and give each one of them a little more to eat—is the dominant problem confronting Asia, Africa and Latin America.

As yet the world food problem is a quiet crisis, perhaps too quiet. It's gaining momentum in a world not completely aware of its social and political ramifications. (14)

**YIELD GAP WIDENING.** Japan's rice yields, which for centuries increased at a barely perceptible rate, have climbed sharply since the yield take-off of the late 1800s. Today Japan produces twice as much rice per acre as most Asian producers. For example, Burma's current yields about equal those Japan achieved in the year 1200 A.D. Philippine yields approximate Japan's in the year 750. Moreover, the yield gap is widening, in rice as in other major food grains. Prewar, top producers got three pounds of rice per acre to each pound grown in low yield countries; the ratio by the early 1960s was 4 to 1.

### CURRENT RICE YIELDS IN SELECTED COUNTRIES RELATED TO JAPAN'S HISTORICAL TREND





THE WORLD FOOD BUDGET. Foreign Regional Analysis Division. FAER-17.

This report presents the results of a study of the supply and utilization of food commodities for the countries of the world. The report also assesses world food needs by 1970 and evaluates the problems and possibilities of closing the food gap. (See pp. 12-16, this issue.)

FOOD BALANCES FOR 24 COUNTRIES OF THE WESTERN HEMISPHERE, 1959-61. ERS-For. 86. FOOD BALANCES FOR 16 COUNTRIES OF WESTERN EUROPE, 1959-61. ERS-For. 87. FOOD BALANCES FOR 12 COUNTRIES IN THE FAR EAST AND OCEANIA, 1959-61. ERS-For. 88. Foreign Regional Analysis Division.

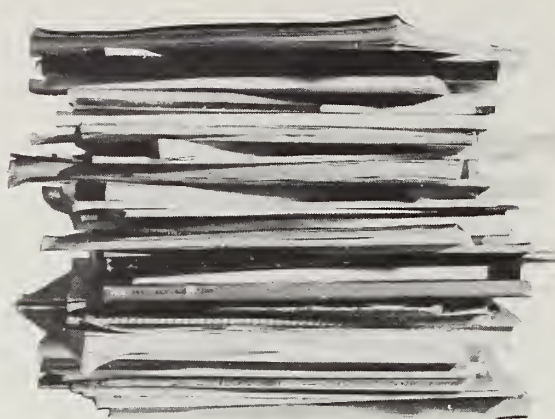
These reports summarize in statistical form the food supplies for 52 free world countries for the three-year period, 1959-61.

LONG-TERM PROJECTIONS OF SUPPLY AND DEMAND FOR AGRICULTURAL PRODUCTS IN ISRAEL, I, GENERAL VIEW AND SUMMARY. Yair Mundlak. Prepared for the Economic Research Service and the Foreign Agricultural Service under contract with the Falk Project for Economic Research in Israel.

This book summarizes and analyzes the results of a study of the supply and demand for agricultural products in Israel for the years 1965 and 1975.

A SURVEY OF AGRICULTURE IN MALAYSIA. R. N. McConnell, Foreign Regional Analysis Division. ERS-For. 95.

This study is largely an attempt to pull together all available pertinent information about the agricultural economies of the states of Malaya, Singapore, Sarawak and Sabah which have merged to form the new nation of Malaysia. (See February 1964 Farm Index.)



## recent publications

*The publications listed here are issued by the Economic Research Service and cooperatively by the state universities and colleges. Unless otherwise noted, reports listed here and under Sources are published by ERS. Single copies are available free from the Division of Information, OMS, U.S. Department of Agriculture, Washington, D.C. 20250. State publications (descriptions below include name of experiment station or university after title) may be obtained from the issuing agencies of the respective states.*

### World Tour

A new 64-page roadmap of world agricultural production and trade reads like a Believe-It-Or-Not tour. For instance, did you know:

—Communist China in 1957-61, a period in which it pushed for "the great leap forward" and fell flat, still managed to produce more rice than India—on several million fewer acres.

—Maine and Idaho notwithstanding, Europe is far and away the potato producer. The USSR alone digs up over 30 per cent of world output.

A hundred other facts and figures are in the maps and charts in *A Graphic Summary of World Agriculture*. Published by the ERS, the *Summary* is available from the Superintendent of Documents, Washington, D. C., 20402. 30 cents a copy.

SPANISH AGRICULTURE—ITS COMPETITIVE POSITION. W. A. Schlegel, Foreign Regional Analysis Division. FAER-18.

Recent improvements in Spain's gold and dollar reserves and the liberalization of approximately 75 per cent of Spain's agricultural imports provide a good opportunity for the sale of U.S. farm products. (See August 1964 Farm Index.)

NIGERIA'S AGRICULTURAL ECONOMY IN BRIEF. S. W. Skinner, Foreign Regional Analysis Division. ERS-For. 98.

Nigeria is still a pioneer land with an economy based on the production of raw materials, chiefly agricultural commodities. At present almost all economic indicators point to sustained expansion and growth. (See November 1964 Farm Index.)

TURKEY'S AGRICULTURAL ECONOMY IN BRIEF. H. M. Holm, Foreign Regional Analysis Division. ERS-For. 97.

Turkey's potential for agricultural improvement is hampered by enormous obstacles, not the least of which is cultural resistance in some areas to progressive change. (See November 1964 Farm Index.)

THE AGRICULTURAL ECONOMY OF TANGANYIKA. C. B. Singleton, Jr. Foreign Regional Analysis Division. ERS-For. 92.

The agricultural sector of Tanganyika's economy accounts for over 70 per cent of the gross domestic product of the country; about 81 per cent of the country's total export earnings are from agricultural products. (See November 1964 Farm Index.)

THE AGRICULTURAL SITUATION AND CROP PROSPECTS IN COMMUNIST CHINA, 1964. M. R. Larsen, Foreign Regional Analysis Division. FAER-20.



The 1964 outlook for agriculture in Mainland China appeared better than for any year since "the great leap forward" in 1958. Total agricultural production, however, likely was below the pre-leap forward period.

THE BALANCE SHEET OF AGRICULTURE, 1964. F. L. Garlock and other, Farm Production Economics Division. Agr. Inf. Bul. 290.

The Balance Sheet of Agriculture brings together the assets and liabilities of agriculture as though it were one large enterprise. The annual changes shown provide a means of appraising the effects of developments in both the farm and nonfarm sectors of the economy on the financial structure of agriculture. (See November 1964 Farm Index.)

INCOME-IMPROVING ADJUSTMENT ALTERNATIVES ON GRADE A DAIRY FARMS IN MINNESOTA. W. B. Lindquist, Farm Production Economics Division, and J. Holt, Minnesota Agricultural Experiment Station. Minn. Agr. Expt. Sta. Bul. 473.

This report suggests possible ways in which Minnesota grade A dairy farms might be expanded or reorganized using resources typically available to farmers. Many of the most profitable farm plans outlined include capital inputs and livestock enterprises much larger than those now typically found in southern Minnesota.

THE FARM WORKER IN A CHANGING AGRICULTURE, PART I IN A SERIES ON TECHNOLOGICAL CHANGE AND FARM LABOR USE, KERN COUNTY, CALIFORNIA, 1961. W. H. Metzler, Farm Production Economics Division in cooperation with the California Agricultural Experiment Station. Giannini Foundation Res. Rpt. 277.

Mechanization is changing labor needs in California cotton production from large numbers of seasonal workers to a small number of skilled technicians. (See November 1964 Farm Index.)

COMPETITIVE RELATIONSHIPS IN MICHIGAN DAIRYING. C. D. Irwin, Farm Production Economics Division, in cooperation with the Michigan Agricultural Experiment Station. Mich. Agr. Expt. Sta. Res. Rpt. 18.

This bulletin reports on research designed to analyze some of the competitive relationships involved in Michigan dairying to see what the future holds.

FLEXIBILITY OF OPERATION IN DAIRY MANUFACTURING PLANTS—CHANGES 1944 TO 1961. D. H. Carley, Marketing Economics Division, and T. L. Cryer, Statistical Reporting Service. AER-61.

The production of manufactured dairy products is becoming concentrated in fewer but more diversified plants. (See October 1964 Farm Index.)

IMPACT OF SEASONALITY OF MILK SUPPLIES ON LABOR COSTS AND EFFICIENCY IN DAIRY MANUFACTURING PLANTS. J. M. Fitzpatrick and C. F. French, Indiana Agricultural Experiment Station, in cooperation with the Marketing Economics Division. Ind. Agr. Expt. Sta. Res. Bul. 774.

As milk receipts varied in Indiana dairy plants, many firms changed the number of hours worked per week to allow some flexibility in scheduling labor.

ECONOMICS OF LOW-CAPACITY IRRIGATION WELLS — TEXAS HIGH PLAINS. W. F. Hughes, Farm Production Economics Division, and A. C. Magee, Texas Agricultural Experiment Station. Tex. Agr. Expt. Sta. MP-710.

Special management practices, a rather heavy per-acre investment in irrigation facilities and long pumping seasons are required to utilize the low heads of water available for irrigation in the Texas High Plains. (See July 1964 Farm Index.)

FOOD SERVICE IN PRIVATE ELEMENTARY AND SECONDARY SCHOOLS. M. Kriesberg, Marketing Economics Division. MRR-678.

The market for food in private schools has grown rapidly. Cash receipts for food served in the nation's private schools were about \$77 million for the 1962-63 school year. (See December 1964 Farm Index.)

### *Numbers in parentheses at end of stories refer to sources listed below:*

1 & 2. Farm Real Estate Market Developments, CD-66 (P); 3. Farm Real Estate Taxes, RET-4 (P); 4. J. S. Ross, "Urea Expands as a Source of Protein Feed in Recent Years," Feed Situa., FdS-205 (P); 5. B. H. Pubols, "Apple Trends and Prospects," Fruit Situa., TFS-152 (P); 6. J. D. Rush, Reducing Risks Through Liability Insurance for South Carolina (S); 7. Economic and Statistical Analysis Division, Distribution of Workers in Selected Professional Occupations by Urban and Rural Residence, United States, 1960, ERS-201 (P); 8. W. W. Bauder and W. F. Kenkel, Effects of Migration on the Open Country Population of Iowa, 1950-60, Iowa State Univ. (M); 9. F. A. Lasley, Coordinating Fluid Milk Supplies in the

Oklahoma Metropolitan Milk Market (M); 10. F. J. Poats (SM); 11. P. L. Henderson and M. E. Thigpen, Evaluation of Effectiveness of a Special Promotional Campaign for Concentrated Orange Juice (M); 12. Foreign Regional Analysis Division, The World Food Budget, 1970, FAER-19 (P); 13. Foreign Regional Analysis Division, The 1965 World Agricultural Situation, (P); 14. L. Brown, Increasing World Food Output (M); 15. G. R. Samson and R. E. Friend (SM).

*Speech (S); published report (P); unpublished manuscript (M); special material (SM).*



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### *Accord on the Rhine*

Two and a half years after they adopted a common agricultural policy, the six members of the European Common Market finally agreed, in mid-December, on unified prices for grains. Prices become effective July 1, 1967.

Probable effect on U.S. grain exports to the Market? A decline, as the new prices stimulate production, particularly in France.

The new agreement is a compromise, similar to the "Mansholt I" plan proposed by the EEC Commission over a year ago. It lowers prices in West Germany, the Market's major grain importer, and raises prices in France, the major producer.

For example, the German target price for soft wheat will go down 10.6 per cent while France's climbs 6.0 per cent. For barley, the German target price will drop 11.4 per cent; the French price will go up 9.6 per cent.

The increase in French target prices—plus the expected elimination of taxes and other assessments on grain—is likely to raise the total price paid to French producers by as much as 20 per cent. Even without the target price increase, just abolishing taxes would increase producer returns about 14 per cent for wheat and 11 per cent for barley.

German farmers will get compensatory payments from the Market for several years.

These are the basic target prices per metric ton: Soft wheat, \$106.25; barley, \$91.25; corn, \$90.62; rye, \$93.75; and durum wheat, \$125.00. (15)

# THE FARM INDEX

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